MAYO CLINIC LABORATORIES

Test Definition: SLA

Soluble Liver Antigen (SLA) IgG Antibodies, Serum

Overview

Useful For
Evaluation of patients at-risk for autoimmune hepatitis or liver disease of unknown etiology

Testing Algorithm
For information see First-Line Screening for Autoimmune Liver Disease Algorithm.

Special Instructions
- First-Line Screening for Autoimmune Liver Disease Algorithm

Method Name
Enzyme-Linked Immunosorbent Assay (ELISA)

NY State Available
Yes

Specimen

Specimen Type
Serum

Specimen Required
Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 0.5 mL Serum
Collection Instructions: Centrifuge and aliquot serum into a plastic vial.

Forms
If not ordering electronically, complete, print, and send Gastroenterology and Hepatology Test Request (T728) with the specimen.

Specimen Minimum Volume
Serum: 0.4 mL

Reject Due To

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

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Autoimmune hepatitis (AIH) is a chronic liver disease characterized by the presence of diverse autoantibodies, increased concentrations of specific liver enzymes, hypergammaglobulinemia and abnormalities in liver histology.(1-3) AIH affects all ages and races and is categorized into type 1 (AIH-1) and type 2 (AIH-2). AIH-1 is by far more common and affects both children and adults, whereas AIH-2 is mainly a pediatric disease.(3,4) AIH-1 is characterized by positive anti-nuclear antibody (ANA) and/or anti-smooth muscle antibody (SMA), whereas AIH-2 is characterized by positive anti-liver kidney microsomal antibody type 1 (LMK-1) and/or anti-liver cytosol type 1 antibodies.(3,4) Anti-soluble liver antigen (anti-SLA) antibody, a disease-specific autoantibody, is seen in both AIH-1 and AIH-2, a feature that, coupled with its high disease specificity, suggests a key pathophysiological role of its antigenic target in the disease process.(3-5) Also referred to as anti-SLA/LP (liver-pancreas) antibody, it was originally identified by Manns M, et al in 1987(6) in patients HBsAg-negative chronic active hepatitis.(reviewed in 3) The SLA autoantibodies were subsequently identified as targeting O-phosphoseryl-tRNA:selenocysteine-tRNA synthase (SepSecS), a 56 kDa cytosolic protein of 501 amino acids detected in both AIH-1 and AIH-2 and are the only disease-specific AIH-associated autoantibody.(3,7)

Anti-soluble liver antigen (anti-SLA) antibody testing is recommended in American Association for the Study of Liver Diseases/International Autoimmune Hepatitis Group (AASLD/IAIHG) guidelines for AIH, especially for identifying patients with cryptogenic hepatitis with features of autoimmune disease.(1,2) Although they appear in only 20% to 30% of AIH or 10% to 30% in cryptogenic (unexplained) chronic hepatitis patients, they are crucial for diagnosis as they can be the sole marker in "seronegative" cases (negative for ANA/SMA).(3,5,8) Anti-SLA antibodies can also be detected in some patients with primary biliary cholangitis-AIH overlap syndrome.(3) In addition, some studies have noted that anti-SLA-positive patients might show lower serum aspartate aminotransferase (AST) levels and lower-globulins compared to ANA/SMA positive patients at diagnosis.(9) Anti-SLA antibodies are very specific for AIH, appearing rarely in healthy individuals and other non-hepatic autoimmune conditions.(3,8) In general, patients positive for anti-SLA antibodies appear to have clinical, histological, and laboratory features to non-SLA positive AIH-1 patients.(8) Although anti-SLA positivity has been reported to demonstrate a more aggressive clinical course, these results appear to be inconclusive.(3,5,9-11) Possibly due to the rarity of anti-SLA antibody-positive AIH patients, characteristics of disease cohorts, or type of assay used in these studies.(3,5,9-11) Therefore, it is likely the requirement of lifelong

immunosuppression and/or higher relapse rates after treatment withdrawal would be based on patient-specific factors, test method, or clinician's judgment.

Detection of anti-SLA antibodies primarily relies on solid-phase immunoassays (SPAs) rather than traditional indirect immunofluorescence assay (IFA).(3-5,8-11) This is because the target antigen-a 50 kDa cytosolic protein identified as seryl-tRNA:selenocysteinyl-tRNA synthase-is soluble and lost during the preparation of standard tissue substrates used in immunofluorescence assays (IFA).(reviewed in 3) Of the SPAs, the enzyme-linked immunosorbent assay was the first method to be validated for use in an international study and is most widely used test.(8,9) The line immunoassay is also another commonly used method.(10) These typically use recombinant human SLA/LP antigen to provide a qualitative and/or semi-quantitative measure of IgG antibodies in patient serum.

Reference Values

Negative: <20.0 U
Equivocal: 20.0-24.9 U
Positive: > or = 25.0 U

Interpretation

A positive anti-SLA (soluble liver antigen) antibody test is highly specific marker for autoimmune hepatitis (AIH), especially in cases where other antibodies are absent. It occurs in approximately 10% to 30% of patients with AIH.

Cautions

A negative result does not rule out AIH. It is a rare autoantibody and many patients with AIH are negative for this specific antibody. It can sometimes be the only positive antibody detected in cases of autoimmune liver disease.

Clinical Reference

1. European Association for the Study of the Liver. EASL Clinical Practice Guidelines: Autoimmune hepatitis. J Hepatol. 2015;63(4):971-1004
2. Mack CL, Adams D, Assis DN, et al. Diagnosis and management of autoimmune hepatitis in adults and children: 2019 Practice Guidance and Guidelines from the American Association for the Study of Liver Diseases. Hepatology. 2020;72(2):671-722
3. Terziroli Beretta-Piccoli B, Mieli-Vergani G, Vergani D. Autoimmune hepatitis: Serum autoantibodies in clinical practice. Clin Rev Allergy Immunol. 2022;63(2):124-137
4. Vitozzi S, Djilali-Saiah I, Lapierre P, Alvarez F. Anti-soluble liver antigen/liver-pancreas (SLA/LP) antibodies in pediatric patients with autoimmune hepatitis. Autoimmunity. 2002;35(8):485-492
5. Ballot E, Homberg JC, Johanet C. Antibodies to soluble liver antigen: an additional marker in type 1 auto-immune hepatitis. J Hepatol. 2000;33(2):208-215
6. Manns M, Gerken G, Kyriatsoulis A, et al. Characterisation of a new subgroup of autoimmune chronic active hepatitis by autoantibodies against a soluble liver antigen. Lancet. 1987;1:292-294. doi:10.1016/S0140-6736(87)92024-1
7. Gelpi C, Sontheimer EJ, Rodriguez-Sanchez JL. Autoantibodies against a serine tRNA-protein complex implicated in cotranslational selenocysteine insertion. Proc Natl Acad Sci U S A. 1992;89(20):9739-9743
8. Baeres M, Herkel J, Czaja AJ, et al. Establishment of standardised SLA/LP immunoassays: specificity for autoimmune hepatitis, worldwide occurrence, and clinical characteristics. Gut. 2002;51(2):259-264
9. Chen ZX, Shao JG, Shen Y, et al. Prognostic implications of antibodies to soluble liver antigen in autoimmune hepatitis: A PRISMA-compliant meta-analysis. Medicine (Baltimore). 2015;94(23):e953
10. Yuksekyayla O, Kina N, Ulaba A, et al. The frequency and clinical significance of antibodies to soluble liver

antigen/liver pancreas in autoimmune hepatitis: a prospective single-center study. Eur J Gastroenterol Hepatol. 2024;36(5):652-656

11. Zachou K, Weiler-Normann C, Muratori L, Muratori P, Lohse AW, Dalekos GN. Permanent immunosuppression in SLA/LP-positive autoimmune hepatitis is required although overall response and survival are similar. Liver Int. 2020;40(2):368-376

Performance

Method Description

Partially purified, full-length recombinant human soluble liver antigen (SLA) is bound to the wells of a polystyrene microwell plate under conditions that will preserve the antigen in its native state. Prediluted controls and diluted patient sera are added to separate wells, allowing any SLA antibodies present to bind to the immobilized antigen. Unbound sample is washed away and an enzyme labeled anti-human IgG conjugate is added to each well. A second incubation allows the enzyme labeled anti-human IgG to bind to any patient antibodies that have become attached to the microwells. After washing away any unbound enzyme labeled anti-human IgG, the remaining enzyme activity is measured by adding a chromogenic substrate and measuring the intensity of the color that develops. The assay can be evaluated spectrophotometrically by measuring and comparing the color intensity that develops in the patient wells with the color in the control wells.(Package insert: QUANTA Lite SLA ELISA 708775. INOVA Diagnostics; Rev. 6, 11/2021)

PDF Report

No

Day(s) Performed

Monday

Report Available

2 to 8 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 Definition: SLA

Soluble Liver Antigen (SLA) IgG Antibodies, Serum

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

83516

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
SLA	Soluble Liver Antigen Ab, IgG, S	32219-8

Result ID	Test Result Name	Result LOINC® Value
SLA	Soluble Liver Antigen Ab, IgG, S	32219-8