# Test Definition: SMAT

Smooth Muscle Antibody Titer, Serum
(Non-Orderable)

## Overview

### Useful For

**Only orderable as part of a reflex.** For more information see SMAS / Smooth Muscle Antibody Screen, Serum.

Antibody titer testing as a part of the evaluation of patients with hepatitis of unknown origin associated with hypergammaglobulinemia and/or abnormal liver enzymes

### Testing Algorithm

If the smooth muscle antibody (SMA) screen is equivocal or positive, then the SMA titer will be performed at an additional charge.

### Method Name

Only orderable as part of a reflex. For more information see SMAS / Smooth Muscle Antibody Screen, Serum.

Indirect Immunofluorescence

### NY State Available

Yes

## Specimen

### Specimen Type

Serum

### Specimen Required

Only orderable as part of a reflex. For more information see SMAS / Smooth Muscle Antibody 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

Serum: 0.4 mL

### 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) | 21 days | |
| | Frozen | 21 days | |

## Clinical & Interpretive

### Clinical Information

Autoimmune hepatitis (AIH) is a chronic disease resulting from immune-mediated liver injury with varied clinical manifestations.(1,2) The precise factors leading to disease initiation and perpetuation are unknown, but likely reflect a combination of genetic predisposition relating to defects in immunological control of autoreactivity, as well as environmental triggers, which precipitate a persistent breakdown in self-tolerance.(2) Initially, patients with AIH may be clinically asymptomatic, and are usually identified only through an incidental finding of abnormal liver function tests.(1-4) At a more advanced stage, patients may manifest with symptoms such as jaundice, pruritus, or ascites, which are secondary to the more extensive liver damage. As implied by the name, AIH has many characteristics of an autoimmune disease, including female predominance, hypergammaglobulinemia, association with specific *HLA* alleles, responsiveness to immunosuppression, and the presence of autoantibodies.(1-3)

The clinical features of AIH are nonspecific and can be seen in variety of liver diseases (drug/alcohol-associated hepatitis, viral hepatitis, primary sclerosing cholangitis, etc), the diagnosis can be challenging. A set of diagnostic criteria for AIH has been published and includes the presence of various autoantibodies, elevated total IgG, evidence of hepatitis on liver histology, and absence of viral markers.(1,3,4) Based on the specific autoantibodies present, AIH can be categorized in three categories.(4) The most prevalent is AIH type 1, linked to the presence of smooth muscle autoantibodies (SMA), antinuclear antibodies (ANA), and perinuclear anti-neutrophil cytoplasmic antibodies. SMA are generally identified by indirect immunofluorescence using a smooth muscle substrate. The antigen specificity of SMA in the context of AIH has been identified as filamentous-actin (F-actin).(3) The combination of autoantibody serology, specifically SMA and anti-F-actin antibodies with liver histology and thorough clinical evaluation are useful in the evaluation of patients with suspected autoimmune hepatitis. SMA are detected in up to 85% of patients with AIH, either alone or in conjunction with ANA.(1,4,5) The SMA titer can also contribute to International Autoimmune Hepatitis Group diagnostic score in patients with a probable or definite diagnosis of AIH.(1,4,5) These antibodies have also been reported in 33% to 65% of cases of primary biliary cholangitis/AIH overlap syndrome(6), the concomitant presence of SMA and AMA being highly suggestive in this setting.

### Reference Values

Only orderable as part of a reflex. For more information see SMAS / Smooth Muscle Antibody Screen, Serum.

Negative
Reference values apply to all ages.

### Interpretation
The presence of smooth muscle antibodies (SMA) may help support the diagnosis of autoimmune hepatitis (AIH) following exclusion from other causes of hepatitis.

A negative result for SMA does not exclude a diagnosis of AIH.

### Cautions
Serologic tests for autoantibodies, including smooth muscle antibodies (SMA), should not be relied upon exclusively to determine the etiology or prognosis of patients with liver disease.

A positive result for SMA may occur in patients who do not have autoimmune hepatitis. A negative result does not exclude a diagnosis of autoimmune hepatitis.

### 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. Mieli-Vergani G, Vergani D, Czaja AJ, et al. Autoimmune hepatitis. Nat Rev Dis Primers. 2018;4:18017
3. Sebode M, Weiler-Normann C, Liwinski T, Schramm C. Autoantibodies in autoimmune liver disease-clinical and diagnostic relevance. Front Immunol. 2018;9:609
4. 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
5. Bogdanos DP, Invernizzi P, Mackay IR, Vergani D. Autoimmune liver serology: current diagnostic and clinical challenges. World J Gastroenterol. 2008;14(21):3374-3387
6. Muratori P, Granito A, Pappas G, et al. The serological profile of the autoimmune hepatitis/primary biliary cirrhosis overlap syndrome. Am J Gastroenterol. 2009;104(6):1420-1425

## Performance

### Method Description
Testing for smooth muscle autoantibodies is performed using a laboratory-developed immunoassay.(Unpublished Mayo method)

### PDF Report
No

### Day(s) Performed
Monday through Saturday

### Report Available

2 to 4 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 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
86015

### LOINC® Information

| Test ID | Test Order Name | Order LOINC® Value |
|---|---|---|
| SMAT | Smooth Muscle Ab Titer, S | 5358-7 |

| Result ID | Test Result Name | Result LOINC® Value |
|---|---|---|
| 608956 | Smooth Muscle Ab Titer, S | 5358-7 |