

# Liver Cytosolic Antigen Type 1 (LC-1) Antibody

## Indications for Ordering

- Differential evaluation of autoimmune liver disease (ALD) of unknown etiology, especially autoimmune hepatitis (AIH) of childhood onset
- Consider
  - If other serologic tests in ALD panel are negative, **or**
  - In combination with specific tests
    - Anti-LKM1
    - ANA
    - F-actin
    - SMA

## Test Description

Liver-Kidney Microsome-1 Antibody, IgG

- Semiquantitative enzyme-linked immunosorbent assay (ELISA)

Liver Cytosolic Antigen Type 1 (LC-1) Antibody, IgG

- Qualitative immunoblot

## Tests to Consider

### Primary tests

[Liver-Kidney Microsome - 1 Antibody, IgG 0055241](#)

- Use in combination with Liver Cytosolic Antigen Type 1 (LC-1) Antibody, IgG
- More likely to be positive than LC-1

[Liver Cytosolic Antigen Type 1 \(LC-1\) Antibody, IgG 2010711](#)

- Use in combination with Liver-Kidney Microsome - 1 Antibody, IgG

### Related tests

[Autoimmune Liver Disease Evaluation with Reflex to Smooth Muscle Antibody \(SMA\), IgG by IFA 2007210](#)

- Recommended first-line panel for evaluation of ALD
  - Negative results do not rule out disease

[ANCA-Associated Vasculitis Profile \(ANCA/MPO/PR-3\) with Reflex to ANCA Titer 2006480](#)

- Initial test in conjunction with Autoimmune Liver Disease Evaluation with Reflex to SMA, IgG by IFA for evaluation of ALD

## Disease Overview

### Incidence

AIH – 0.85-1.9/100,000 per year for white adults of northern European ancestry

### Prevalence

- ALD
  - 5% of all liver diseases
- AIH type 1
  - Most common type of AIH
- AIH type 2
  - Rare – 4% of AIH individuals in the U.S.

### Age

- AIH type 1 – bimodal peaks (10-30 years, 40-50 years)
- AIH type 2 – childhood

### Physiology

#### AIH

- Etiology – antibodies directed against the liver
- Chronic course with slow progression – may resemble other chronic liver diseases (eg, alcoholic cirrhosis, chronic viral hepatitis)

### Clinical presentation

- Clinical features vary widely, ~25% asymptomatic
  - Arthralgias
  - Anorexia, fatigue, lethargy, malaise
  - Hepatomegaly, nausea, upper abdominal pain, jaundice
    - Progression to cirrhosis and liver failure possible
- Antibody-negative disease
  - Same presentation and histology as antibody-positive AIH

## Diagnostic/prognostic issues

- May be difficult to clinically distinguish between AIH types 1 and 2
- Important to distinguish AIH type 1 from type 2 (prognostically)
  - Higher risk of fulminant course and progression to cirrhosis in type 2
  - Cirrhosis often present in children at time of diagnosis
- Antibody testing may be helpful for diagnosis
  - Antibodies to liver-kidney microsome-1 (LKM1) and/or LC-1 are diagnostic for AIH type 2
    - LKM1 antibodies should be analyzed by measuring antibodies to cytochrome P4502D6
- Diagnosis of exclusion
  - No other etiology found for liver disease/cirrhosis – key to this diagnosis
- Liver biopsy may be appropriate in certain individuals
  - Should be performed when diagnosis is still unclear
  - Considered “gold standard”

## Test Interpretation

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### Typical antibody pattern in AIH-1

- pANCA – atypical staining
- SMA, F-actin – positive
- ANA – homogeneous pattern most common
- LC-1 – negative
- SLA – variably positive, more common in children

### Results

#### Typical antibody pattern in AIH-2

- pANCA – positive (rare) or negative
- LKM-1 – positive
- LC-1 – positive
- ANA, SMA, F-actin, M2, SLA – negative

### Limitations

- Negative antibody testing does not rule out ALD
- All interpretation of antibody patterns must be done in conjunction with clinical presentation
  - Overlap may occur between diseases and antibodies
- Neither LKM-1 nor LC-1 has absolute diagnostic sensitivity for AIH type 2