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MAYO CLINIC LABORATORIES

# Test Definition: SLFAT

Cryptococcus Antigen Titer, Lateral Flow Assay, Serum

## Overview

### Useful For

Monitoring *Cryptococcus* antigen titers in serum

Aiding in the diagnosis of cryptococcosis

This test **should not be used** as a test of cure or to guide treatment decisions.

### Method Name

Lateral Flow Assay (LFA)

### NY State Available

No

## 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
**Collection Instructions:** Centrifuge and aliquot serum into a plastic vial

### Forms

If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:
-Kidney Transplant Test Request
-Infectious Disease Serology Test Request (T916)

### Specimen Minimum Volume

0.3 mL

### Reject Due To

| | |
|---|---|
| Gross hemolysis | Reject |

| | |
|---|---|
| Gross lipemia | Reject |

### Specimen Stability Information

| Specimen Type | Temperature | Time | Special Container |
|---|---|---|---|
| Serum | Refrigerated (preferred) | 14 days | |
| | Frozen | 14 days | |

## Clinical & Interpretive

### Clinical Information

Cryptococcosis is an invasive fungal infection caused by *Cryptococcus neoformans* or *Cryptococcus gattii*. *C neoformans* has been isolated from several sites in nature, particularly weathered pigeon droppings. *C gattii* was previously only associated with tropical and subtropical regions. More recently, however, this organism has been found to be endemic in British Columbia and the Pacific Northwestern US and is associated with several different tree species.

Infection is usually acquired via the pulmonary route. Patients are often unaware of any exposure history. Approximately half of the patients with symptomatic disease have a predisposing immunosuppressive condition such as AIDS, steroid therapy, lymphoma, or sarcoidosis. Symptoms may include fever, headache, dizziness, ataxia, somnolence, and cough. While the majority of *C neoformans* infections occur in immunocompromised patient populations, *C gattii* has a higher predilection for infection of healthy individuals.(1,2)

In addition to the lungs, cryptococcal infections frequently involve the central nervous system (CNS), particularly in patients infected with HIV. Mortality among patients with CNS cryptococcosis may approach 25% despite antibiotic therapy. Untreated CNS cryptococcosis is invariably fatal. Disseminated disease may affect any organ system and usually occurs in immunosuppressed individuals.

### Reference Values

Negative

Reference values apply to all ages.

### Interpretation

The presence of cryptococcal antigen in any body fluid (serum or cerebrospinal fluid) is indicative of cryptococcosis.

Disseminated infection is usually accompanied by a positive serum test.

Declining titers may indicate regression of infection. However, monitoring titers to cryptococcal antigen should not be used as a test of cure or to guide treatment decisions. Low-level titers may persist for extended periods of time following appropriate therapy and resolution of infection.(3,4)

### Cautions

*Cryptococcus* antigen titers acquired by the lateral flow assay may be higher than titers achieved by other *Cryptococcus*

antigen assays. Titers acquired by different assay methods are not interchangeable.

*Cryptococcus* antigen titers should be followed using the same assay.

A positive result is indicative of cryptococcosis; however, all test results should be reviewed in light of other clinical findings.

Testing should not be performed as a screening procedure for the general populations and should only be performed when clinical evidence suggests the diagnosis of cryptococcal disease.

Testing hemolyzed serum samples may lead to false-negative results due to the high background color on the lateral flow assay strip.

Although rare, extremely high concentrations of cryptococcal antigen can result in weak test lines and in extreme instances, yield negative test results.

This assay has not been evaluated for cross reactivity in patients with trichosporonosis.

## Supportive Data

End-point titers between the IMMY LFA and the Meridian latex agglutination test were compared for 10 samples positive for *Cryptococcus* antigen. While the overall qualitative correlation was good, these data indicate that the endpoint titer achieved by the IMMY LFA was at least 2-fold higher than that achieved by the Meridian latex agglutination assay in 8 of 10 (80%) serum samples. (Table 1).(5) Therefore, *Cryptococcus* antigen titers should be monitored by using the same method on serially-collected samples; titers acquired by different methods are not interchangeable.

| Reciprocal Endpoint Titer by: | | |
|---|---|---|
| **Serum Sample** | **Meridian Latex Agglutination** | **IMMY LFA** |
| 1 | 256 | 160 |
| 2 | 8 | 10 |
| 3 | 16 | 80 |
| 4 | 1,024 | 2,560 |
| 5 | Negative* | 10 |
| 6 | 8 | 20 |
| 7 | 2 | 10 |
| 8 | 4 | 10 |
| 9 | 64 | 160 |
| 10 | 8 | 20 |

*This sample showed 1+ reactivity by the Meridian latex agglutination assay upon screening but was interpreted as negative according to the package insert requirement for 2+ reactivity.

## Clinical Reference

1. Speed B, Dunt D. Clinical and host differences between infections with the two varieties of *Cryptococcus neoformans*.

Clin Infect Dis. 1995;21(1):28-34
2. Chen S, Sorrell T, Nimmo G, et al. Epidemiology and host- and variety-dependent characteristics of infection due to *Cryptococcus neoformans* in Australia and New Zealand. Australasian Cryptococcal Study Group. Clin Infect Dis. 2000;31(2):499-505. doi:10.1086/313992
3. Lu H, Zhou Y, Yin Y, Pan X, Weng X. Cryptococcal antigen test revisited: significance for cryptococcal meningitis therapy monitoring in a tertiary Chinese hospital. J Clin Microbiol. 2005;43(6):2989-2990
4. Perfect JR, Dismukes WE, Dromer F, et al. Clinical practice guidelines for the management of cryptococcal disease: 2010 update by the Infectious Diseases Society of America. Clin Infect Dis. 2010 ;50(3):291-322
5. Binnicker MJ, Jespersen DJ, Bestrom JE, Rollins LO. A comparison of four assays for detection of cryptococcal antigen. Clin Vaccine Immunol. 2012;19(12):1988-1990
6. Perfect JR: Cryptococcosis (*Cryptococcus neoformans* and *Cryptococcus gattii*). In: Bennett JE, Dolin R, Blaser MJ, eds. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 9th ed. Elsevier; 2020:3146-3161
7. Chang CC, Harrison TS, Bicanic TA, et al. Global guideline for the diagnosis and management of cryptococcosis: an initiative of the ECMM and ISHAM in cooperation with the ASM [published correction appears in Lancet Infect Dis. 2024 Aug;24(8):e485. doi:10.1016/S1473-3099(24)00426-2]. Lancet Infect Dis. 2024;24(8):e495-e512. doi:10.1016/S1473-3099(23)00731-4
8. Perfect JR, Bicanic T. Cryptococcosis diagnosis and treatment: What do we know now. Fungal Genet Biol. 2015;78:49-54. doi:10.1016/j.fgb.2014.10.003

## Performance

### Method Description

The *Cryptococcus* antigen (CrAg) lateral flow assay is a sandwich immunochromatographic assay. Specimens and diluent are added to a test tube and the lateral flow device is added. The test uses specimen wicking to capture gold-conjugated, anticryptococcal antigen monoclonal antibodies and gold-conjugated control antibodies deposited on the test membrane. If cryptococcal antigen is present in the specimen, it binds to the gold-conjugated, anticryptococcal antigen antibodies. This complex wicks up the membrane and interacts with the test line, which has immobilized anticryptococcal antigen monoclonal antibodies. The antigen-antibody complex forms a sandwich at the test line causing a visible line to form. A valid test shows a visible line at the control line. Positive test results create 2 lines (control and specimen), while negative results form only the control line.(Package insert: CrAg Lateral Flow Assay, IMMY, Norman, OK, Rev 2012)

### PDF Report

No

### Day(s) Performed

Monday through Sunday

### Report Available

Same day/1 to 2 days

### Specimen Retention Time

14 days

# Test Definition: SLFAT

Cryptococcus Antigen Titer, Lateral Flow Assay, Serum

### Performing Laboratory Location

Mayo Clinic Jacksonville Clinical Lab

## 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

87899

### LOINC® Information

| Test ID | Test Order Name | Order LOINC® Value |
|---|---|---|
| SLFAT | Cryptococcus Ag Titer, LFA, S | 9818-6 |

| Result ID | Test Result Name | Result LOINC® Value |
|---|---|---|
| 62077 | Cryptococcus Ag Titer, LFA, S | 9818-6 |