MAYO CLINIC LABORATORIES

# Test Definition: HIVDI

HIV-1 and HIV-2 Antibody Confirmation and Differentiation, Serum

## Overview

### Useful For

Confirmation and differentiation of HIV-1 and HIV-2 antibodies in serum specimens that show reactive results with third-(HIV-1/-2 antibody only) and 4th-generation (HIV antigen and antibody) HIV serologic assays

Confirmation and differentiation of HIV-1 and HIV-2 antibodies in cadaveric blood or hemolyzed serum specimens that show reactive results with initial HIV serologic screening assays

This test is **not useful** as a screening test for HIV infection in symptomatic or asymptomatic individuals. It is not to be used as a screening or confirmatory test for blood donor specimens.

This test is **not useful** for maternal or newborn HIV screening for specimens originating in New York State.

### Reflex Tests

| Test Id | Reporting Name | Available Separately | Always Performed |
|---|---|---|---|
| HIS12 | HIV-1/HIV-2 RNA Detect, S | Yes | No |

### Testing Algorithm

This HIV-1 and HIV-2 antibody (Ab) confirmation and differentiation test begins with Geenius HIV-1/2 supplemental assay.

This test is for confirmation and differentiation of HIV-1/2 antibodies. If the following result types are obtained, HIV-1/HIV-1 RNA detection will be performed at an additional charge:
-Negative for both HIV-1 Ab and HIV-2 Ab
-Indeterminate for HIV-1 Ab but negative for HIV-2 Ab
-Negative for HIV-1 Ab but indeterminate for HIV-2 Ab
-Indeterminate for both HIV-1 Ab and HIV-2 Ab
-Positive for both HIV-1 Ab and HIV-2 Ab

For more information see HIV Testing Algorithm (Fourth Generation Screening Assay), Including Follow-up of Reactive Rapid Serologic Test Results.

### Special Instructions

- HIV Testing Algorithm (Fourth-Generation Screening Assay), Including Follow-up of Reactive Rapid Serologic Test Results

### Method Name

Rapid Immunochromatographic Assay

### NY State Available

No

## Specimen

### Specimen Type
Serum SST

### Ordering Guidance
If testing is needed for autopsy or cadaver blood sourced specimens, order the US Food and Drug Administration-licensed assay: HV1CD / HIV-1 and HIV-2 Antibodies for Cadaveric or Hemolyzed Specimens, Serum.

This test should **not be used** to test or screen pregnant individuals. For testing such patients, order HVPPS / HIV-1 and HIV-2 Antibody Confirmation and Differentiation Prenatal, Serum.

Screening, supplemental, or confirmatory serologic tests for HIV-1 or HIV-2 antibodies cannot distinguish between active neonatal HIV infection and passive transfer of maternal HIV antibodies in infants during the postnatal period (up to 2 years). Diagnosis of HIV infection in newborns and infants up to 2 years old should be made by virologic tests, such as detection of HIV RNA (HIP12 / HIV-1/HIV-2 RNA Detection, Plasma or HIS12 / HIV-1/HIV-2 RNA Detection, Serum).

This test is **not useful** for follow-up testing of patients with reactive results from any rapid HIV tests. Per the latest Centers for Disease Control and Prevention recommended HIV testing algorithm, these patients should be tested subsequently with laboratory-based HIV antigen and antibody combination immunoassays, such as HIVDX / HIV-1 and HIV-2 Antigen and Antibody Diagnostic Evaluation, Plasma or HIVDS / HIV-1 and HIV-2 Antigen and Antibody Diagnostic Evaluation, Serum.

### Necessary Information
**Date of collection is required.**

### Specimen Required
**Supplies**: Sarstedt Aliquot Tube, 5 mL (T914)
**Collection Container/Tube:** Serum gel
**Submission Container/Tube:** Plastic vial
**Specimen Volume:** 1.5 mL Serum
**Collection Instructions:** Centrifuge and aliquot plasma into plastic vial.

### Forms
If not ordering electronically, complete, print, and send an Infectious Disease Serology Test Request (T916) with the specimen.

### Specimen Minimum Volume
Serum: 0.8 mL

### Reject Due To

| | |
|---|---|
| Gross hemolysis | OK |
| Gross lipemia | OK |
| Gross icterus | OK |

### Specimen Stability Information

| Specimen Type | Temperature | Time | Special Container |
|---|---|---|---|
| Serum SST | Frozen (preferred) | 30 days | |
| | Refrigerated | 6 days | |

## Clinical & Interpretive

### Clinical Information

AIDS is caused by 2 known types of HIV. HIV type 1 (HIV-1) is found in patients with AIDS or AIDS-related complex and in asymptomatic infected individuals at high risk for AIDS. The virus is transmitted by sexual contact, by exposure to infected blood or blood products, or from an infected mother to her fetus or infant. HIV type 2 (HIV-2) infection is endemic only in West Africa, and it has been identified in individuals who had sexual relations with individuals from that geographic region. HIV-2 is similar to HIV-1 in viral morphology, overall genomic structure, and its ability to cause AIDS.

Antibodies against HIV-1 and HIV-2 are usually not detectable until 6 to 12 weeks following exposure and are almost always detectable by 12 months. They may fall to undetectable levels (ie, seroreversion) in the terminal stage of AIDS when the patient's immune system is severely depressed.

Routine serologic screening of patients at risk for HIV-1 or HIV-2 infection usually begins with a HIV-1/-2 antigen and/or antibody screening test, which may be performed by various US Food and Drug Administration-approved assay methods, including rapid HIV antibody tests, enzyme immunoassays, and chemiluminescent immunoassays. In testing algorithms that begin with these methods, supplemental or confirmatory testing should be requested only for specimens that are repeatedly reactive by these methods according to assay manufacturers' instructions for use.

### Reference Values

Negative

### Interpretation

Negative results for both HIV-1 and HIV-2 antibodies usually indicate the absence of HIV-1 and HIV-2 infection. However, negative results do not rule-out acute or early HIV infection in patients with reactive initial combined HIV-1/-2 antigen and antibody test results. HIS12 / HIV-1/HIV-2 RNA Detection, Serum will be performed automatically per testing algorithm.

Positive HIV-1 antibody but negative HIV-2 antibody results indicate the presence of HIV-1 infection. Together with reactive initial combined HIV-1/-2 antigen and antibody test results, individuals with these results are presumed to have HIV-1 infection. Verification of a first-time positive test result is recommended for the diagnosis of HIV-1 infection. Additional testing with a newly submitted plasma specimen for HIVQN / HIV-1 RNA Detection and Quantification,

Plasma. HIV-1 RNA quantification in plasma is recommended to determine the baseline HIV-1 viral load prior to initiating antiretroviral treatment.

Positive HIV-1 antibody but indeterminate HIV-2 antibody results indicate the presence of HIV-1 infection with probable cross-reactivity of HIV-1 antibodies with HIV-2 antigens on the assay strip. Verification of a first-time positive test result is recommended for the diagnosis of HIV-1 infection by submitting a plasma specimen for HIV-1 RNA quantification (HIVQN / HIV-1 RNA Detection and Quantification, Plasma).

Indeterminate HIV-1 antibody but negative HIV-2 antibody results suggest either very early HIV-1 infection (in individuals with risk factors) or the presence of nonspecific cross-reactivity between the patient serum specimen and HIV-1 antigens on the assay strip. HIS12 / HIV-1/HIV-2 RNA Detection, Serum will be performed automatically per testing algorithm.

Negative HIV-1 antibody but indeterminate HIV-2 antibody results may be due to acute HIV-1 infection, very early HIV-2 infection (in individuals with risk factors), or the presence of nonspecific cross-reactivity between the patient serum specimen and HIV-2 antigens on the assay strip. HIS12 / HIV-1/HIV-2 RNA Detection, Serum will be performed automatically per testing algorithm.

Positive results for both HIV-1 and HIV-2 antibodies suggest the probable presence of HIV-1 and HIV-2 coinfection. However, such results may rarely be due to either HIV-1 infection with HIV-2 antibody cross-reactivity or HIV-2 infection with HIV-1 antibody cross-reactivity (eg, absence of HIV-1 p24 and p31 bands). Verification of a first-time positive test result is recommended for the diagnosis of HIV infection. HIS12 / HIV-1/HIV-2 RNA Detection, Serum will be performed automatically per testing algorithm.

Indeterminate results for both HIV-1 and HIV-2 antibodies indicate either very early HIV infection (in individuals with risk factors) or the presence of nonspecific cross-reactivity between the patients' specimens and HIV antigens on the assay strip. Nonspecific cross-reactivity may be due to recent non-HIV infections, hypergammaglobulinemic states, connective tissue disorders, or pregnancy (alloantibodies). HIS12/ HIV-1/HIV-2 RNA Detection, Serum will be performed automatically per testing algorithm.

Negative HIV-1 antibody but positive HIV-2 antibody results indicate the presence of HIV-2 infection. Together with a reactive initial HIV-1/-2 antigen and antibody screening test results, individuals with such results are presumed to have HIV-2 infection. Verification of a first-time positive test result is recommended for the diagnosis of HIV-2 infection by submitting a new plasma specimen for HV2QU / HIV-2 RNA Detection and Quantification.

Reactive HIV-1 antibody but positive HIV-2 antibody results usually indicate the presence of HIV-2 infection with HIV-1 antibody cross-reactivity (eg, presence of only HIV-1 gp41 and/or gp160 band). However, such results may rarely be due to HIV-1 and HIV-2 coinfection. Verification of a first-time positive test result is recommended for the diagnosis of HIV-2 infection by submitting a new plasma specimen for HV2QU / HIV-2 RNA Detection and Quantification.

Indeterminate HIV-1 antibody but positive HIV-2 antibody results indicate the presence of HIV-2 infection with probable cross-reactivity of HIV-2 antibodies with HIV-1 antigens on the assay strip. Verification of a first-time positive test result is recommended for the diagnosis of HIV-2 infection by submitting a new plasma specimen for HV2QU / HIV-2 RNA Detection and Quantification.

For more information see HIV Testing Algorithm (Fourth Generation Screening Assay), Including Follow-up of Reactive Rapid Serologic Test Results

### Cautions

A negative result for both HIV-1 and HIV-2 antibodies does not rule-out acute HIV infection.

All initially positive supplemental or confirmatory HIV test results should be verified by submitting a second specimen for repeat testing. Such positive HIV test results are required under laws in many states in the United States to be reported to the departments of health of the respective states where the patients reside.

Recipients of HIV-1 vaccine (eg, participants in HIV-1 vaccine study trials) may develop vaccine-specific antibodies that may cross-react with this test and yield to a positive, indeterminate, or unreadable HIV-1 antibody result. However, the patient may or may not be infected with HIV-1.

Assay performance characteristics have not been established for the following specimen characteristics:
-Heat-inactivated specimens
-Cadaveric specimens
-Presence of particulate matter

### Clinical Reference

1. Centers for Disease Control and Prevention and Association of Public Health Laboratories. Laboratory testing for the diagnosis of HIV infection: Updated recommendations. June 27, 2014. Accessed August 12, 2026. Available at https://stacks.cdc.gov/view/cdc/23447
2. Malloch L, Kadivar K, Putz J, et al. Comparative evaluation of the Bio-Rad Geenius HIV-1/2 confirmatory assay and the Bio-Rad Multispot HIV-1/2 rapid test as an alternative differentiation assay for CLSI M53 algorithm-I. J Clin Virol. 2013;58(Suppl 1):e85-e91
3. Montesinos I, Eykmans J, Delforge ML. Evaluation of the Bio-Rad Geenius HIV-1/2 test as confirmatory assay. J Clin Virol. 2014;60(4):399-401
4. Abbate I, Pergola C, Pisciotta M, et al. Evaluation in a clinical setting of the performances of a new rapid confirmatory assay for HIV-1/2 serodiagnosis. J Clin Virol. 2014;61(1):166-169
5. Duncan D, Duncan J, Kramer B, et al. An HIV diagnostic testing algorithm using the cobas HIV-1/HIV-2 qualitative assay for HIV type differentiation and confirmation. J Clin Microbiol. 2021;59(7):e03030-20. doi:10.1128/JCM.03030-20

## Performance

### Method Description

The Geenius HIV 1/2 Supplemental Assay cassette contains antibody-binding protein A, which is conjugated to colloidal gold dye particles, and HIV-1 and HIV-2 antigens, which are bound to the membrane solid phase. The sample is applied to the sample and buffer well. After the sample and buffer have migrated onto the test strip, additional buffer is added to the buffer well. The buffer causes the specimens and reagents to flow laterally and facilitates the binding of antibodies to the antigens. In a reactive sample, the antibodies are captured by the antigens immobilized in the test area.

The protein A-colloidal gold binds to the captured antibodies causing development of pink/purple lines. When there are no HIV antibodies, there are no pink/purple lines in the test area. The sample continues to migrate through the membrane and a pink/purple line develops in the control area, which contains protein A. This built-in procedural control provides evidence that the test was performed properly and that the sample and reagents have migrated through the cassette.(Package insert: Geenius HIV 1/2 Supplemental Assay. Bio-Rad Laboratories; 07/2019)

### PDF Report
No

### Day(s) Performed
Monday through Friday

### Report Available
1 to 3 days

### Specimen Retention Time
14 days

### 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
86701
86702
87535 (if appropriate)
87538 (if appropriate)

### LOINC® Information

| Test ID | Test Order Name | Order LOINC® Value |
|---|---|---|

| | | |
|---|---|---|
| HIVDI | HIV Ab Confirm / Differentiation, S | 89365-1 |

| Result ID | Test Result Name | Result LOINC® Value |
|---|---|---|
| 36112 | HIV-1 Ab Differentiation, S | 68961-2 |
| 36113 | HIV-2 Ab Differentiation, S | 81641-3 |