MAYO CLINIC LABORATORIES

Test Definition: HSVG

Herpes Simplex Virus (HSV) Type 1- and Type 2-Specific Antibodies, IgG, Serum

Overview

Useful For

Determining whether a patient has been previously exposed to herpes simplex virus (HSV) types 1 and 2

Distinguishing between infection caused by HSV types 1 and 2, especially in patients with subclinical or unrecognized HSV infection

This test should **not be used** to diagnose active or recent infection.

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
HS1G	HSV Type 1 Ab, IgG, S	No	Yes
HS2G	HSV Type 2 Ab, IgG, S	No	Yes

Method Name

Multiplex Flow Immunoassay (MFI)

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: 0.6 mL
Collection Instructions: Centrifuge and aliquot serum into plastic vial.

Forms

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

Specimen Minimum Volume
0.4 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Gross icterus	Reject

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information
Herpes simplex virus (HSV) types 1 and 2 are members of the *Herpesviridae* family and produce infections that range from mild stomatitis to disseminated and fatal disease. Clinical conditions associated with HSV infection include gingivostomatitis, keratitis, encephalitis, vesicular skin eruptions, aseptic meningitis, neonatal herpes, genital tract infections, and disseminated primary infection.

Infections with HSV types 1 and 2 can differ significantly in their clinical manifestations and severity. HSV type 2 primarily causes urogenital infections and is found almost exclusively in adults. HSV type 1 is closely associated with orolabial infection, although genital infection with this virus can be common in certain populations.

The diagnosis of HSV infections is routinely made based on clinical findings and supported by laboratory testing, primarily using polymerase chain reaction to detect viral DNA. However, in instances of subclinical or unrecognized HSV infection, serologic testing for IgG-class antibodies to type-specific HSV glycoprotein G may be useful. There are several circumstances where it may be important to distinguish between infection caused by HSV types 1 and 2 (eg, risk of reactivation). In addition, the results of HSV type-specific IgG testing are sometimes used during pregnancy to identify risks of congenital HSV disease and allow for focused counseling prior to delivery.

Reference Values
Negative

Interpretation
This assay detects IgG-class antibodies to type-specific herpes simplex virus (HSV) glycoprotein G and may allow for the differentiation of infection caused by HSV types 1 and 2. The presence of IgG-class antibodies to HSV types 1 or 2 indicates previous exposure, and does not necessarily indicate that HSV is the causative agent of an acute illness.

Cautions

Detection of IgG-class antibodies to herpes simplex virus (HSV) should not be used routinely as the primary means of diagnosing HSV infection. For patients presenting with presumed acute infection with HSV, a clinical specimen (eg, oral, dermal, or genital lesion) should be sampled and submitted for detection of HSV types 1 and 2 by polymerase chain reaction.

Serum specimens collected too early in the course of infection may not have detectable levels of HSV IgG. In cases of suspected early disease, a repeat serum specimen should be collected 14 to 21 days later and submitted for testing.

The presence of IgG-class antibodies to either HSV type 1 or 2 does not differentiate between remote infection or acute disease.

HSV serology cannot distinguish genital from nongenital infections.

The predictive value of positive or negative results depends on the prevalence of disease and the pretest likelihood of HSV-1 and HSV-2.

False-positive results may occur. Repeat testing, or testing by a different method, may be indicated in some settings (eg, patients with low likelihood of HSV infection).

Supportive Data

Accuracy:
To evaluate the accuracy of the BioPlex HSV assay, 505 prospective serum specimens were tested by enzyme immunoassay (EIA) (HerpeSelect, Focus Diagnostics) and the BioPlex HSV-1/2 IgG assay. Specimens that had discordant results after initial testing were repeated by both assays during the same freeze/thaw cycle.

Further discrepancies were evaluated by glycoprotein G type-specific Western blot (WB) at the University of Washington Virology laboratory.
The results are summarized in Tables 1 and 2 below:

Table 1. Comparison of the Bio-Rad BioPlex HSV-1 IgG assay to the HerpeSelect HSV-1 EIA using prospective serum specimens (n=505).

HSV-1 by BioPlex		**HSV-1 by HerpeSelect EIA**			
		Positive	Negative	Equivocal	Total
	Positive	254	5(a)	0	259
	Negative	2(b)	240	1	243
	Equivocal	0	3	0	3
	Total	256	248	1	505

a. All 5 specimens were positive by WB
b. Both specimens were positive by WB
Sensitivity=99.2% (254/256); 95% CI (97.0, 99.9)
Specificity=96.8% (240/248); 95% CI (93.7, 98.5)
Overall percent agreement=97.8% (494/505); 95% CI (96.1, 98.8)

Table 2. Comparison of the Bio-Rad BioPlex HSV-2 IgG assay to the HerpeSelect HSV-2 EIA using prospective serum specimens (n=505).

HSV-2 by BioPlex		**HSV-2 by HerpeSelect**			
		Positive	Negative	Equivocal	Total
	Positive	115	9(a)	2	126
	Negative	1(b)	376	0	377
	Equivocal	1	1	0	2
	Total	117	386	2	505

a. Two of 9 specimens were positive by WB; 2 of these 9 specimens were equivocal by WB.

b. This specimen was negative by WB.

Sensitivity=98.3% (115/117); 95% CI (93.6, 99.9)

Specificity=97.4% (376/386); 95% CI (95.2, 98.7)

Overall percent agreement=97.2% (493/505); 95% CI (95.4, 98.4)

Clinical Reference

1. Ashley RL, Wald A. Genital herpes: review of the epidemic and potential use of type-specific serology. Clin Microbiol Rev. 1999;12(1):1-8

2. Ashley RL, Wu L, Pickering JW, et al. Premarket evaluation of a commercial glycoprotein G-based enzyme immunoassay for herpes simplex virus type-specific antibodies. J Clin Microbiol. 1998;36(1):294-295

3. Brown ZA, Selke S, Zeh J, et al. The acquisition of herpes simplex virus during pregnancy. N Engl J Med 1997;337(8):509-515

4. Lafferty WE, Coombs RW, Benedetti J, et al. Recurrences after oral and genital herpes simplex infection. Influence of site of infection and viral type. N Engl J Med. 1987;316(23):1444-1449

5. Binnicker MJ, Jespersen DJ, Harring JA. Evaluation of three multiplex flow immunoassays to enzyme immunoassay for the detection and differentiation of IgG class antibodies to herpes simplex virus types 1 and 2. Clin Vaccine Immunol. 2010;17(2):253-257

6. Nath P, Kabir MA, Doust SK, Ray A. Diagnosis of herpes simplex virus: Laboratory and point-of-care techniques. Infect Dis Rep. 2021;13(2):518-539

Performance

Method Description

The BioPlex 2200 HSV (herpes simplex virus)-1 and HSV-2 IgG assay uses multiplex flow immunoassay technology. Two different populations of dyed beads are each coated with glycoprotein G -based antigens associated with HSV types 1 or 2. Patient sample is combined with sample diluent and bead set reagent in a reaction vessel. The mixture is incubated at 37 degrees C. After a wash cycle, antihuman IgG antibody conjugated to phycoerythrin (PE) is added to the mixture and incubated at 37 degrees C. Excess conjugate is removed in another wash cycle, and the beads are resuspended in wash buffer. The bead mixture then passes through a detector where the identity of the dyed beads is determined by the fluorescence of the dyes, and the amount of antibody captured by the antigen is determined by the fluorescence of the attached PE. Raw data is calculated in relative fluorescence intensity. Three additional dyed beads, an internal standard bead, a serum verification bead, and a reagent blank bead are present in each reaction mixture to verify detector

response, the addition of serum to the reaction vessel, and the absence of significant nonspecific binding in serum.(Package insert: BioPlex 2200 System HSV-1 and HSV-2 IgG. Bio-Rad Laboratories; Version 665-0533C_EN, 04/2019)

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available
Same day/1 to 2 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 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
86695
86696

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
HSVG	HSV Types 1 and 2 Ab, IgG, S	81621-5

Result ID	Test Result Name	Result LOINC® Value
HS1G	HSV Type 1 Ab, IgG, S	51916-5
HS2G	HSV Type 2 Ab, IgG, S	43180-9