Overview

Useful For
Diagnosing infectious mononucleosis when a mononucleosis screening procedure is negative and infectious mononucleosis or a complication of Epstein-Barr virus infection is suspected

This assay is not intended for viral isolation or identification.

Profile Information

<table>
<thead>
<tr>
<th>Test Id</th>
<th>Reporting Name</th>
<th>Available Separately</th>
<th>Always Performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBVM</td>
<td>EBV VCA IgM Ab, S</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>EBVG</td>
<td>EBV VCA IgG Ab, S</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>EBVNA</td>
<td>EBNA Ab, S</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Method Name
Multiplex Flow Immunoassay

NY State Available
Yes

Specimen

Specimen Type
Serum

Specimen Required

Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Specimen Volume: 1 mL

Forms
If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:
- General Request (T239)
- Infectious Disease Serology Test Request (T916)

Specimen Minimum Volume
0.6 mL
Test Definition: SEBV
Epstein-Barr Virus (EBV) Antibody Profile, Serum

Reject Due To

<table>
<thead>
<tr>
<th>Condition</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross hemolysis</td>
<td>Reject</td>
</tr>
<tr>
<td>Gross lipemia</td>
<td>Reject</td>
</tr>
<tr>
<td>Gross icterus</td>
<td>Reject</td>
</tr>
<tr>
<td>Heat-inactivated specimen</td>
<td>Reject</td>
</tr>
</tbody>
</table>

Specimen Stability Information

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum</td>
<td>Refrigerated (preferred)</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frozen</td>
<td>14 days</td>
<td></td>
</tr>
</tbody>
</table>

Clinical & Interpretive

Clinical Information
Epstein-Barr virus (EBV), a member of the herpesvirus group, is the etiologic agent of infectious mononucleosis. EBV infections are difficult to diagnose in the laboratory since the virus does not grow in standard cell cultures. The majority of infections can be recognized, however, by testing the patient’s serum for heterophile antibodies (rapid latex slide agglutination test; eg, MONOS / Infectious Mononucleosis, Rapid Test, Serum), which usually appear within the first 3 weeks of illness but then decline rapidly within a few weeks. The heterophile antibody, however, fails to develop in about 10% of adults, more frequently in children, and almost uniformly in infants with primary EBV infections. Most of these heterophile antibody-negative cases of infectious mononucleosis-like infections are due to cytomegalovirus, but in a series of 43 cases, EBV was the cause in 7. In cases where EBV is suspected but the heterophile antibody is not detected, an evaluation of the EBV-specific antibody profile (eg, EBV viral capsid antigen: VCA IgM, EBV VCA IgG, and EBV nuclear antigen: EBNA) may be useful.

Infection with EBV usually occurs early in life. For several weeks to months after acute onset of the infection, it is spread by upper respiratory secretions that contain the virus. Among the clinical disorders due to EBV infection, infectious mononucleosis is the most common. Other disorders due to EBV infection have been recognized for several years, including African-type Burkitt lymphoma and nasopharyngeal carcinoma. EBV infection may also cause lymphoproliferative syndromes, especially in patients who have undergone renal or bone marrow transplantation and in those who have AIDS.

Reference Values
Epstein-Barr Virus (EBV) VIRAL CAPSID ANTIGEN (VCA) IgM ANTIBODY
Negative

Epstein-Barr Virus (EBV) VIRAL CAPSID ANTIGEN (VCA) IgG ANTIBODY
Negative

EPSTEIN-BARR NUCLEAR ANTIGEN (EBNA) ANTIBODIES
Negative
**Interpretation**

The test has 3 components: viral capsid antigen (VCA) IgG, VCA IgM, and Epstein-Barr nuclear antigen (EBNA). Presence of VCA IgM antibodies indicates recent primary infection with Epstein-Barr virus (EBV). The presence of VCA IgG antibodies indicates infection sometime in the past. Antibodies to EBNA develop 6 to 8 weeks after primary infection and are detectable for life. Over 90% of the normal adult population has IgG class antibodies to VCA and EBNA. Few patients who have been infected with EBV will fail to develop antibodies to the EBNA (approximately 5%-10%).

<table>
<thead>
<tr>
<th>Possible results</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

*Results indicate infection with EBV at some time (VCA IgG positive). However, the time of the infection cannot be predicted (ie, recent or past) since antibodies to EBNA usually develop after primary infection (recent) or, alternatively, approximately 5% to 10% of patients with EBV never develop antibodies to EBNA (past).

**Cautions**

Specimens collected too early during the course of the disease may not contain detectable antibody to Epstein-Barr virus (EBV). Another specimen collected 1 to 2 weeks later may be required.

Test results should be evaluated in relation to patient symptoms, clinical history, and other laboratory findings.

The timing of the appearance of IgG antibodies to viral capsid antigen (VCA) or Epstein-Barr nuclear antigen (EBNA) or IgM antibodies to VCA is subject to variations among individuals and serological assays.

This assay's performance characteristics with immunosuppressed individuals, newborns, cord blood, or matrices other than human serum have not been established.

Assay performance characteristics have not been established for the diagnosis of nasopharyngeal carcinoma, Burkitt lymphoma, and other EBV-associated lymphomas.

Anti-VCA-specific IgG may compete with IgM for binding sites, leading to false-negative results. Rheumatoid factor (RF), in the presence of specific IgG, may contribute to false-positive results. The absorbent in the VCA IgM diluent is intended to neutralize the effects of RF and specific IgG. Studies have shown that the absorbent was able to neutralize up to 98% of the activity in a specimen known to contain 3,328 IU/mL of RF activity.

Testing for VCA IgM should not be performed as a screening procedure on the general population. The predictive value of positive or negative results depends on the pretest likelihood of Epstein-Barr-associated disease being present. Testing should only be performed when clinical evidence suggests the diagnosis of this syndrome.

**Clinical Reference**
Performance

Method Description
For the detection of viral capsid antigen (VCA)-IgG antibody, EA-D antibody, and Epstein-Barr nuclear antigen (EBNA) antibody, an aliquot of the patient serum, sample diluent, and bead reagent are combined in a reaction vessel. After washing, antihuman-IgG antibody conjugated to phycoerythrin (PE) is added to the beads and incubated. Another wash step removes excess conjugate, and beads are subsequently resuspended in wash buffer. The bead mixture passes through a detector where the identity of each bead is determined by the bead’s dye fluorescence. In addition, the amount of antibody captured by the antigen is measured by the fluorescence of the bound PE.

For the detection of VCA-IgM antibody, the patient sample is combined with diluent containing antihuman IgG and bead reagent. The antihuman IgG is incorporated in the mix because any anti-VCA-specific IgG present may compete with the IgM for binding sites, leading to false-negative VCA-IgM results. After a wash cycle, antihuman-IgM antibody conjugated to PE is added. Detection of anti-VCA-specific IgM is performed as described above for the VCA IgG assay.(Package inserts: BioPlex 2200 System EBV IgG and EBV IgM. Bio-Rad Laboratories; 2012)

PDF Report
No

Day(s) Performed
Monday through Saturday

Report Available
Same day/1 to 2 days

Specimen Retention Time
14 days

Performing Laboratory Location
Rochester

Fees & Codes

Fees

Test Definition: SEBV
Epstein-Barr Virus (EBV) Antibody Profile, Serum

- 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 Regional Manager. 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
86664-EBNA
86665 x 2-VCA, IgG and IgM

LOINC® Information

<table>
<thead>
<tr>
<th>Test ID</th>
<th>Test Order Name</th>
<th>Order LOINC® Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEBV</td>
<td>EBV Ab Profile, S</td>
<td>87554-2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Result ID</th>
<th>Test Result Name</th>
<th>Result LOINC® Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBVG</td>
<td>EBV VCA IgG Ab, S</td>
<td>30339-6</td>
</tr>
<tr>
<td>EBVM</td>
<td>EBV VCA IgM Ab, S</td>
<td>30340-4</td>
</tr>
<tr>
<td>EBNA</td>
<td>EBNA Ab, S</td>
<td>22296-8</td>
</tr>
<tr>
<td>INT73</td>
<td>Interpretation</td>
<td>69048-7</td>
</tr>
</tbody>
</table>