CE EBV VCA and EBNA IgG Rapid Test Kit (Colloidal Gold)

IVD

A rapid test for a qualitative detection of IgG antibodies against Viral Capsid Antigen (VCA) and EB Nuclear Antigen (EBNA) of Epstein-Barr virus in human whole blood, serum or plasma.

For professional in vitro diagnostic use only.

PRODUCT NAME

EBV VCA and EBNA IgG Rapid Test Kit (Colloidal Gold)

SPECIFICATION

25 tests/kit, 5 tests/kit, 1 test/kit

INTENDED USE

The EBV VCA and EBNA IgG Combo Rapid Test is a rapid chromatographic immunoassay for the qualitative detection of IgG antibodies against VCA and EBNA of Epstein-Barr virus in human whole blood, serum, or plasma.

SUMMARY

Epstein-Barr Virus (EBV) is a ubiquitous human virus which causes infectious mononucleosis (IM), a self-limiting lymphoproliferative disease. By adulthood virtually everyone has been infected with and has developed immunity to the virus. In underdeveloped countries, seroconversion to the virus takes place in early childhood and is usually asymptomatic. In more affluent countries, primary EBV infections are often delayed until adolescence or later, and manifest as IM in about 50% of this age group. Following seroconversion, whether symptomatic or not, EBV establishes a chronic, latent infection in B lymphocytes which probably lasts for life. EBV replicates in oropharyngeal epithelial cells and is present in the saliva of most patients with IM. In addition, 10-20% of healthy persons who are EBV antibody positive shed the virus in their oral secretions. Reactivation of the latent viral carrier state, as evidenced by increased rates of virus shedding, is enhanced by immunosuppression, pregnancy, malnutrition, or disease. Chronic EBV infections, whether latent or active, are rarely associated with disease. However, EBV has been implicated at least as a contributing factor in the etiology of nasopharyngeal carcinoma, Burkitt's lymphoma, and lymphomas in immunodeficient patients. The Paul-Bunnell-Davidsohn test for heterophile antibody is highly specific for IM10. However, 10-15% of adults and higher percentages of children and infants with primary EBV infections do not develop heterophile antibodies. There is a need for EBV-specific serological tests to differentiate primary EBV infections that are heterophile negative, from mononucleosis-like illnesses caused by other agents such as cytomegalovirus, adenovirus, and Toxoplasma gondii. Antibody titers to specific EBV antigens correlate with different stages of IM.

Both IgM and IgG antibodies to the viral capsid antigen (VCA) peak three to four weeks after primary EBV infection. IgM anti-VCA antibodies decline rapidly and are usually undetectable after 12 weeks. IgG anti-VCA antibody titers decline slowly after peaking but last indefinitely. Antibodies to EBV nuclear antigen (EBNA) develop from one month to six months after infection and, like anti-VCA antibodies, persist indefinitely. Antibodies to EBNA indicate that the infection was not recent EBV early antigens (EA) consist of two components; diffuse (D), and restricted (R). The terms D and R reflect the different patterns of immunofluorescent staining exhibited by the two components. Antibodies to EA appear transiently for up to three months during the acute phase of IM in 85% of patients.

The antibody response to EA in IM patients is usually to the D component, whereas silent seroconversion to EBV in children produces antibodies to the R component. A definitive diagnosis of primary EBV infection can be made with 95% of acute phase sera based on the detection of antibodies to VCA, EBNA, and EA The EBV VCA and EBNA IgG Combo Rapid Test is a rapid test that utilizes a combination of EBV VCA antigen or EBNA antigen coated colored particles for the detection of IgG antibodies to VCA or EBNA of Epstein-Barr virus in human whole blood, serum, or plasma.

PRINCIPLE

The EBV VCA and EBNA IgG Combo Rapid Test is a qualitative membrane-based immunoassay for the detection of VCA IgG antibody and EBNA IgG antibody to Epstein-Barr virus in whole blood, serum, or plasma. During testing, the specimen reacts with Epstein-Barr virus VCA antigen-conjugate or EBNA antigen-conjugate in the test . The gold antigen conjugate will bind to Epstein-Barr virus VCA antibody or EBNA antibody in the specimen sample which in turn will bind with anti-human IgG coated on the membrane. The mixture migrates upward on the membrane, the anti-human IgG on the membrane will bind the antibody-antigen complex causing a colored line to form in the test line region of the test membrane. The intensity of the color will vary depending upon the amount of antibody present in the sample. The appearance of colored line in the test region should be considered as positive result. To serve as a procedural control, a colored line will always appear in the control line region indicating that proper volume of specimen has been added and membrane wicking has occurred.

MATERIALS

Materials provided

• Test devices • Package insert • Buffer • Droppers

Materials Required but Not Provided

• Specimen Collection Containers • Centrifuge (for plasma only)
• Micropipettes • Timer
• Lancets (for fingerstick whole blood only)

WARNINGS AND PRECAUTIONS

• For professional in vitro diagnostic use only. Do not use beyond the expiration date.
• Do not eat, drink or smoke in the area where the specimens or kits are handled.
• Handle all specimens as if they contain infectious agents. Observe established precautions against microbiological hazards throughout the procedure and follow the standard procedures for proper disposal of specimens.
• Wear protective clothing such as laboratory coats, disposable gloves and eye protection when specimens are assayed.
• Humidity and temperature can adversely affect results.

STORAGE AND STABILITY

Store as packaged in the sealed pouch either at room temperature or refrigerated (2-30°C). The test is stable through the expiration date printed on the sealed pouch. The test must remain in the sealed pouch until use. DO NOT FREEZE. Do not use beyond the expiration date.

SPECIMEN COLLECTION AND PREPARATION

• The EBV VCA and EBNA IgG Combo Rapid Test can be performed using whole blood, serum, or plasma.
• To collect Fingerstick Whole Blood Specimens:
• Wash the patient's hand with soap and warm water or clean with an alcohol swab. Allow to dry.
• Massage the hand without touching the puncture site by rubbing down the hand towards the fingertip of the middle or ring finger.
• Puncture the skin with a sterile lancet. Wipe away the first sign of blood.
• Gently rub the hand from wrist to palm to finger to form a rounded drop of blood over the puncture site.
• Add the Fingerstick Whole Blood specimen to the test by using a dropper or micropipette measuring 20ul. The dropper provided with the test dispenses approximately 20ul in one drop even if more blood is aspirated in the dropper.
• Separate serum or plasma from blood as soon as possible to avoid hemolysis. Use only clear, non-hemolyzed specimens.
• Testing should be performed immediately after specimen collection. Do not leave the specimens at room temperature for prolonged periods. Serum and plasma specimens may be stored at 2-8 °C for up to 3 days. For long-term storage, specimens should be kept below -20 °C. Whole blood collected by venipuncture should be stored at 2-8 °C if the test is to be run within 2 days of collection. Do not freeze whole blood specimens. Whole blood collected by fingerstick should be tested immediately.
• Bring specimens to room temperature prior to testing. Frozen specimens must be completely thawed and mixed well prior to testing. Specimens should not be frozen and thawed repeatedly.
• If specimens are to be shipped, they should be packed in compliance with local regulations for transportation of etiologic agents.
• EDTA K2, Heparin sodium, Sodium citrate and Potassium oxalate can be used as the anticoagulant for collecting the specimen.

DIRECTIONS FOR USE

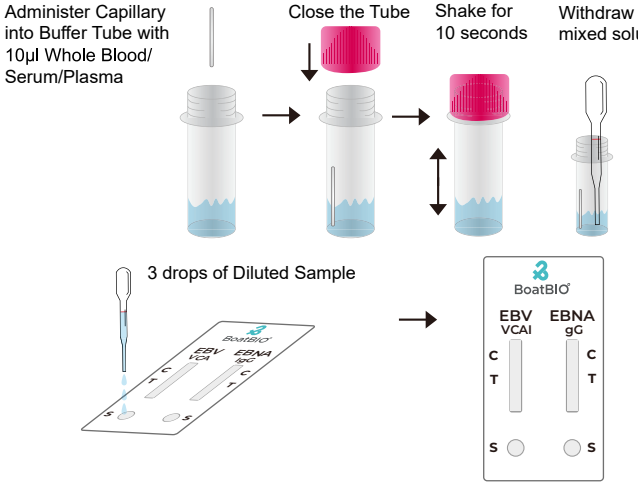
Allow test devices, specimen, buffer and/or controls to equilibrate to room temperature (15-30 °C) prior to testing.

1.Bring the pouch to room temperature before opening it. Remove the test from the sealed pouch and use it within 1 hour.

• To use a dropper: Hold the dropper vertically, draw the specimen about 1cm above the upper end of the nozzle as shown in illustration, transfer 1 drop of the serum/plasma (approximately 10μl) or 2 drops of the whole blood (approximately 20μl) to each specimen well (S) of the test , then add 2 drops of buffer (approximately 80μl) to each specimen well (S) and start the timer. See the illustration below.
• To use a micropipette: Pipette and dispense 10μl of serum/plasma or 20μl of whole blood to each specimen well (S) of the test , then add 2 drops of buffer (approximately 80μl) to each specimen well (S) and start the timer. See the illustration below.
• To use a micropipette: Pipette and dispense 10μl of serum/plasma or 20μl of whole blood to the specimen well (S) of the test , then add 2 drops of buffer (approximately 80μl) and start the timer.

3. Wait for the colored line(s) to appear. Read result at 15 minutes. Do not interpret the result after 20 minutes.

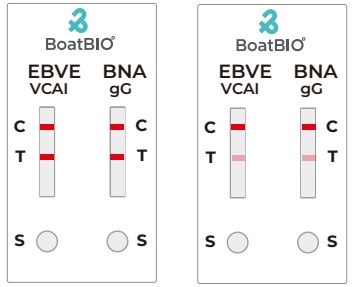
Note: It is suggested not to use the buffer beyond 6 months after opening the vial.



INTERPRETATION OF RESULTS

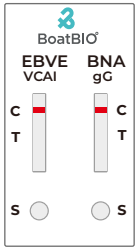
POSITIVE: * Two distinct colored lines appear. One colored line should be in the control region (C) and another colored line should be in the test region (T).

***NOTE:** The intensity of the color in the test line region (T) will vary depending on the concentration of EBV VCA IgG or EBNA IgG present in the specimen. Therefore, any shade of color in the test region should be considered positive.



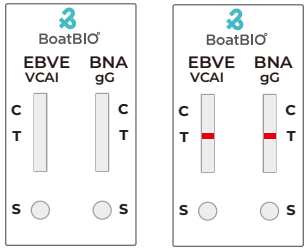
Postive

NEGATIVE: One colored line appears in the control region (C). No apparent colored line appears in the test region (T).



Negative

INVALID: Control line fails to appear. Insufficient specimen volume or incorrect procedural techniques are the most likely reasons for control line failure. Review the procedure and repeat the test with a new test . If the problem persists, discontinue using the test kit immediately and contact your local distributor.



Invalid

QUALITY CONTROL

Internal procedural controls are included in the test. A colored line appearing in the control region (C) is an internal positive procedural control. It confirms sufficient specimen volume and correct procedural technique. Control standards are not supplied with this kit; however, it is recommended that positive and negative controls be tested as a good laboratory practice to confirm the test procedure and to verify proper test performance.

LIMITATIONS

1. The EBV VCA and EBNA IgG Combo Rapid Test is for in vitro diagnostic use only. The test should be used for the detection of EBV VCA and/or EBNA antibodies in whole blood, serum or plasma specimens only. Neither the quantitative value nor the rate of increase in EBV antibody concentration can be determined by this qualitative test.
2. The EBV VCA and EBNA IgG Combo Rapid Test will only indicate the presence of EBV VCA and/or EBNA antibodies in the specimen and should not be used as the sole criteria for the diagnosis of EBV.
3. A negative test result does not preclude the possibility of exposure to or infection with Epstein-Barr viruses.
4. A negative result can occur if the quantity of EBV VCA IgG and/or EBNA IgG present in the specimen is below the detection limits of the assay, or the EBV VCA IgG and/or EBNA IgG that are detected are not present during the stage of disease in which a sample is collected.
5. Some specimens containing unusually high titer of heterophile antibodies or rheumatoid factor may affect expected results.
6. If the symptom persists, while the result from EBV VCA and EBNA IgG Combo Rapid Test is negative, it is recommended to collect the sample again from the patient few days later or test with an alternative test method such as PCR, ELISA.
7. The results obtained with this test should only be interpreted in conjunction with other diagnostic procedures and clinical findings.
8. The hematocrit of the whole blood should be between 25% and 65%.

EXPECTED VALUES

The EBV VCA and EBNA IgG Combo Rapid Test has been compared with a leading commercial EBV ELISA test. The correlation between these two systems is over 96%.

PERFORMANCE CHARACTERISTICS

Sensitivity and Specificity

The EBV VCA and EBNA IgG Combo Rapid Test has been compared with a leading commercial EBV ELISA test using clinical specimens.

The results show that the relative sensitivity of the EBV VCA IgG Rapid Test is 95.6% and the relative specificity is 96.5%, the relative sensitivity of the EBNA IgG Rapid Test is 96.2% and the relative specificity is 97.8%.

Method		ECLIA		Total Results
EBV VCA IgG Rapid Test	Results	Positive	Negative	
	Positive	109	5	114
	Negative	5	139	144
Total Results		114	144	158

Relative sensitivity: 95.6% (95%CI*: 90.1%~98.6%)
Relative specificity: 96.5% (95%CI*: 92.1%~98.9%)
Accuracy: 96.1% (95%CI*: 93.0%~98.1%)

Method		ECLIA		Total Results
EBV VCA IgG Rapid Test	Results	Positive	Negative	
	Positive	102	3	105
	Negative	4	133	137
Total Results		106	136	242

Relative sensitivity: 96.2% (95%CI*: 90.6%~99.0%)
Relative specificity: 97.8% (95%CI*: 93.7%~99.5%)
Accuracy: 97.1% (95%CI*: 94.1%~98.8%)

*Confidence Intervals

Precision

Intra-Assay

Within-run precision has been determined by using 5 replicates of seven specimens: negative, VCA IgG low positive, VCA IgG middle positive, VCA IgG high positive, EBNA IgG low positive, EBNA IgG middle positive and EBNA IgG high positive. The specimens were correctly identified >99% of the time.

Inter-Assay

Between-run precision has been determined by 5 independent assays on the same seven specimens: negative, VCA IgG low positive, VCA IgG middle positive, VCA IgG high positive, EBNA IgG low positive, EBNA IgG middle positive and EBNA IgG high positive. Three different lots of the EBV VCA and EBNA IgG Combo Rapid Test have been tested using these specimens. The specimens were correctly identified >99% of the time.

Cross-reactivity

The EBV VCA and EBNA IgG Combo Rapid Test has been tested by anti-HAMA, RF, HBsAg, HBsAb, HBeAg, HBeAb, HBcAb, anti-Syphilis, anti-HIV, anti-HCV, anti-H. pylori, anti-CMV IgG, anti-CMV IgM, anti-Rubella IgG, anti-Rubella IgM, anti-TOXO IgG and anti-TOXO IgM positive specimens. The results showed no cross-reactivity.

Interfering Substances

The following potentially interfering substances were added to EBV VCA IgG and EBNA IgG negative and positive specimens.

Acetaminophen: 20mg/dL	Caffeine: 20mg/dL	Acetylsalicylic Acid: 20mg/dL
Gentisic Acid: 20mg/dL	Ascorbic Acid: 2g/dL	Albumin: 2g/dL
Creatin: 200mg/dL	Hemoglobin 1000mg/dL	Bilirubin: 1g/dL
Oxalic Acid: 60mg/dL		

None of the substances at the concentration tested interfered in the assay.

INDEX OF SYMBOLS

Symbol	Used For	Symbol	Used For
	Use-by date		Consult instructions for use
LOT	Batch code	IVD	In vitro diagnostic medical device
	Temperature limit		Manufacturer
	Please don't reuse it		Keep away from sunlight
	Don't use the product when the package is damaged		Keep dry
	Date of manufacture	Σ	Tests per kit
CE	CE Mark		Biological Risks
EC REP	Authorized representative in the European Community		

BASIC INFORMATION

Ningbo BESTest Bio-technology Co.,Ltd.
Address: No.80 building, No.777, Qing Feng Road, Cicheng Town,Jiangbei District, Ning Bo, Zhejiang, China 315033
Tel: 0086 571 2799 8736

EC REP **CMC MEDICAL DEVICES & DRUGS S.L**
Address: C/Horacio Lengo Nº 18 CP 29006, Málaga-Spain
Tel: +34951214054
Email - info@cmcmedicaldevices.com