

Yellow Fever IgG/IgM Rapid Test Cassette (Serum/Plasma/Whole Blood)

Package Insert

FOR THE QUALITATIVE ASSESSMENT OF YELLOW FEVER IgG/IgM IN HUMAN SERUM, PLASMA OR WHOLE BLOOD.

For Professional In Vitro Diagnostic Use Only.

PACKAGE

25 Tests/Kit

INTENDED USE

The Yellow Fever IgG/IgM Rapid Test Cassette (Serum/Plasma/Whole Blood) is a rapid chromatographic immunoassay for the qualitative detection of specific Yellow Fever virus antibody IgG and IgM in human serum, plasma or whole blood as an aid in the diagnosis of primary and secondary Yellow Fever infections.

SUMMARY

Yellow fever virus (YFV) is an RNA virus belonging to the genus Flavivirus. The genus Flavivirus includes more than 100 species, including a number of other important human pathogens such as dengue virus (DENV), Japanese encephalitis virus (JEV), Zika virus (ZIKV), West Nile virus (WNV), Kasanur Forest virus and tick-borne encephalitis virus. The yellow fever virus originated in Africa and has been circulating for thousands of years between Aedes aegypti and monkeys in the rainforests of Africa. It is a potentially deadly mosquito-borne flavivirus that can be transmitted to humans through the bite of certain Aedes mosquitoes or Hamagose mosquitoes. Today, yellow fever is on the rise. The World Health Organization reported 127,000 severe cases and 45,000 deaths in 2013. It is estimated that 90% of yellow fever infections occur in Africa, and large parts of South America are also considered at risk.

The Yellow Fever Virus IgG/IgM Rapid Test Cassette (Serum/Plasma/ Whole Blood) is a rapid test that utilizes a combination of Yellow fever antigen coated colored particles for the detection of Yellow Fever Virus antibody in human serum, plasma or whole blood.

PRINCIPLE

The Yellow Fever IgG/IgM Rapid Test Cassette (Serum/Plasma/ Whole Blood) detects IgG and IgM to Yellow fever through visual interpretation of color development. Yellow fever antigens, anti-human IgG and anti-human IgM are used to detect specific antibodies in the human serum, plasma or whole blood samples. When a sample is added to the sample well on the test panel, specific IgG and/or IgM antibodies, if present, will bind to the Yellow fever antigens conjugated to colored particles on the sample pad. As the specimen migrates along the strip by capillary action and interacts with reagents on the membrane, the complex will be captured by anti-human IgG and/or anti-human IgM antibodies immobilized at the detection zone. Excess colored particle are captured at the internal control zone.

The presence of a red band(s) in the test region indicates a positive result for the particular IgG and/or IgM antibodies, while its absence indicates a negative result. A red band at the control region (C) serves as a procedural control, indicating that the proper volume of specimen has been added and membrane wicking is working.

REAGENTS

The test contains Yellow Fever virus antigen protein labeled latex particles and coated anti-human IgG, anti-human IgM antibody on the membrane.

PRECAUTIONS

- For professional in vitro diagnostic use only. Do not use the kit beyond the expiration date.
- Do not eat, drink or smoke in the area where the specimens or kits are handled.
- Do not use the test if the pouch is damaged.
- Handle all specimens as if they contain infectious agents. Observe established precautions against microbiological hazards throughout testing 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 being tested.
- The used test should be discarded according to local regulations.

STORAGE AND STABILITY

The original packaging should be stored at 2~ 30 °C, to avoid light, keep dry. The test cassette is stable through the expiration date printed on the sealed pouch. The test cassette must remain in the sealed pouch until use. **DO NOT FREEZE.** Do not use beyond the expiration date, especially at temperatures above 30°C or under high humidity conditions, should be used immediately once it is opened.

SPECIMEN COLLECTION AND PREPARATION

1. The Yellow Fever IgG/IgM Antibody Rapid Test Cassette (Serum/Plasma/Whole Blood)

can be performed using in human serum, plasma or whole blood.

2. 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 capillary tube:
 - Touch the end of the capillary tube to the blood until filled to approximately 10µL. Avoid air bubbles.
 - Place the bulb onto the top end of the capillary tube, then squeeze the bulb to dispense the whole blood to the specimen area of the test cassette.
3. Separate serum or plasma from blood as soon as possible to avoid hemolysis. Use only clear, non-hemolyzed specimens.
4. 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.
5. 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.
6. If specimens are to be shipped, they should be packed in compliance with federal regulations for transportation of etiologic agents.

MATERIALS

Materials provided	
● Test Cassette	● Buffer
● Disposable plastic pipette	● Package Insert
Materials required but not provided	
● Specimen collection container	● Centrifuge (for plasma only)
● Micropipette	● Timer
● Lancet (for fingerstick whole blood only)	

DIRECTIONS FOR USE

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

1. Bring the pouch to room temperature before opening. Remove the test cassette from the sealed pouch and use it as soon as possible.
2. Place the test cassette on a clean and level surface.

For Serum or Plasma specimens: Hold the dropper vertically and draw the serum or plasma up to the fill line as shown in illustration below (approximately 10µL). Transfer the specimen to the specimen well (S), then add 2 drops of buffer (approximately 80µL) to the specimen well (B), and start the timer. See illustration below..

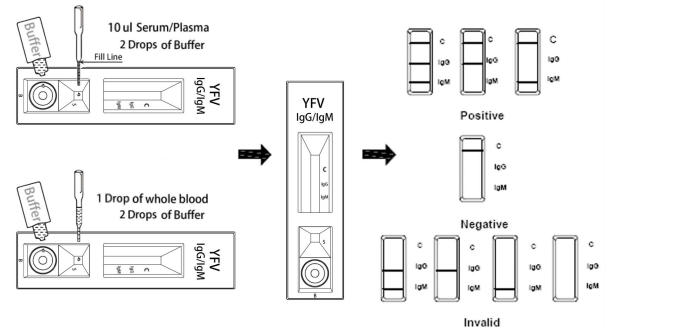
For Venipuncture Whole Blood specimen:

Using the provided 10µL dropper and transfer 1 drop (about 20µL) of whole blood to the specimen area, then add 2 drops of buffer (approximately 80µL) to the buffer hole and start the timer. See illustration below.

For Fingerstick Whole Blood specimen:

To use a capillary tube: Fill the capillary tube and transfer 1 drop (about 20µL) of fingerstick whole blood specimen to the specimen area of test cassette, then add 2 drops of buffer (approximately 80µL) to the buffer hole and start the timer.

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



INTERPRETATION OF RESULTS

IgG POSITIVE: *Two distinct colored lines appear. One color line should be in the control region (C) and another color line should be in the test region IgG. The result is positive for Yellow Fever virus specific-IgG and is probably indicative of secondary Yellow Fever infection.

IgM POSITIVE: *Two distinct colored lines appear. One color line should be in the control region (C) and another color line should be in the test region IgM. The result is positive for Yellow Fever virus specific-IgM antibodies and is indicative of primary Yellow Fever infection.

IgG AND IgM POSITIVE: *One color line should be in the control region (C), and two colored lines should appear in test line regions IgG and IgM. The color intensities of the lines do not have to match. The result is positive for IgG & IgM antibodies and is indicative of secondary Yellow Fever infection.

***NOTE:** The intensity of the color in the test line region(s) (IgG and/or IgM) will vary depending on the concentration of Yellow Fever antibodies in the specimen. Therefore, any shade of color in the test line region(s) (IgG and/or IgM) should be considered positive.

NEGATIVE: The colored line in the control line region (C). No line appears in test line regions IgG or IgM (IgG or IgM).

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

QUALITY CONTROL

Internal procedural controls are included in the test. A color 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. A negative test result cannot exclude a recent infection.
2. In early infections and some secondary infections, detectable levels of IgM antibodies may be low. Some patients may not produce detectable levels of antibody within the first seven to ten days after infection. Where symptoms persist, patients should be re-tested 3-4 days after the first specimen. Serological cross-reactivity across the Flavivirus group (Yellow Fever virus, St. Louis encephalitis, Japanese encephalitis, West Nile and yellow fever virus) is common.
3. A negative result for an individual subject indicates absence of detectable Zika antibodies. However, a negative test result does not preclude the possibility of exposure to or infection with Yellow Fever virus.
4. A negative result can occur if the quantity of the Yellow Fever virus antibodies present in the specimen is below the detection limits of the assay, or the antibodies 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. The results obtained with this test should only be interpreted in conjunction with other diagnostic procedures and clinical findings.

PERFORMANCE CHARACTERISTICS

Clinical Sensitivity, Specificity and Accuracy

Yellow Fever IgG/IgM Antibody Rapid Test Cassette (Serum/Plasma/Whole Blood) has been evaluated with specimens obtained from a population of symptomatic and asymptomatic individuals. Results were confirmed by a leading commercial Yellow Fever ELISA test. Yellow Fever IgG/IgM Antibody Rapid Test Cassette (Serum/Plasma/Whole Blood) vs ELISA

Zika IgG Test vs. EIA				
Method		EIA		Total
Zika IgG Test	Results	Positive	Negative	Results
	Positive	118	2	120
	Negative	2	215	217
Total Results		120	217	337

Relative Sensitivity: 98.33% (95%CI*: 93.75%~99.92%)*

Relative Specificity: 99.08% (95%CI*: 96.48%~99.97%)*

Accuracy: 98.81% (95%CI*: 96.88%~99.65%)*

*Confidence Interval

Zika IgM Test vs. EIA				
Method		EIA		Total
Zika IgM Test	Results	Positive	Negative	Results
	Positive	125	3	128
	Negative	2	207	209
Total Results		127	210	337

Relative Sensitivity: 98.43% (95%CI*: 94.08%~99.92%)*

Relative Specificity: 98.57% (95%CI*: 95.69%~99.71%)*

Accuracy: 98.52% (95%CI*:96.47%~99.47%)*

*Confidence Interval

Precision

Intra-Assay

Within-run precision has been determined by using 10 replicates of three specimens:a negative, a low positive,and a high positive.The negative,low,positive,and high positive values were correctly identified >99% of the time.

Inter-Assay

Between-run precision has been determined by 10 independent assays on the same three specimens,a negative,a low positive,and a high positive.Three different lots of the Zika IgG/IgM Rapid Test Cassette(Serum/Plasma/Whole blood) have been tested over a 3-day period using negative,low positive,and high positive specimens.The specimens were correctly identified >99% of the time.

Cross-reactivity

The Yellow Fever Virus IgG/IgM Rapid Test Cassette (Serum/Plasma/Whole blood) has been tested for Toxo, HBV, HCV, HIV, RF, Syphilis, H. Pylori, CMV, Rubella,HSV 1/2 positive specimens.The results showed no cross-reactivity.

BIBLIOGRAPHY

[1] Carter HR. Yellow fever: an epidemiological and historical study of its place of origin. Williams & Wilkins; Baltimore (MD): 1931.

[2] Strode GK, ed, Bugher JC, ed, *et al.* Yellow Fever. New York, NY: McGraw-Hill Book Co; 1951.

[3] Monath TP, Gershman M, Staples JE, Barrett A. Yellow fever vaccine In: Plotkin SA, Orenstein WA, Offit PA, eds. Vaccines. Philadelphia, PA: Saunders; 2012:870–968.

SYMBOLS

Symbol	Meaning	Symbol	Meaning
	In vitro diagnostic medical device		Storage temperature limit
	Manufacturer		Authorized representative in the European Community
	Date of Manufacture		Use by date
	Do not reuse		Consult instruction for use
	Batch code		Meet the requirements of EC Directive 98/79/EC

BASIC INFORMATION