

Yellow Fever Virus Antigen Rapid Test Cassette (Serum/Plasma/Whole Blood)

Package Insert

A RAPID TEST FOR A QUALITATIVE TEST FOR THE DETECTION OF NS1 ANTIGEN OF YELLOW FEVER VIRUS IN HUMAN SERUM, PLASMA OR WHOLE BLOOD.

For Professional In vitro Diagnostic Use Only.

PACKAGE

25 Tests/Kit

INTENDED USE

The Yellow Fever Virus Antigen Rapid Test Cassette (Serum/Plasma/Whole Blood) is a rapid chromatographic immunoassay for the qualitative detection of NS1 antigen of Yellow fever virus in human serum, plasma or whole blood as an aid in the diagnosis of Yellow fever virus 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 Antigen Rapid Test Cassette (Serum/Plasma/Whole Blood) is a rapid test that utilizes a combination of Yellow fever antibodies coated colored particles for the detection of Yellow Fever Virus antigen in human serum, plasma or whole blood.

PRINCIPLE

The Yellow Fever Virus Antigen Rapid Test (Whole Blood/Serum/Plasma) is a qualitative, membrane based on immunoassay for the detection of NS1 antigen of yellow fever virus in whole blood, serum or plasma. The membrane is pre-coated with specific capture antibodies in the test line region of the test. During testing, the whole blood, serum or plasma specimen reacts with the particle coated with specific antibodies. The mixture migrates upward on the membrane chromatographically by capillary action to react with specific capture reagents on the membrane and generate a colored line. The presence of this colored line in the specific test line region indicates a positive result, while its absence indicates a negative 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.

REAGENTS

The test cassette contains anti-Yellow fever virus antibody conjugated latex particles and anti-Yellow fever virus antibody coated 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 kit can be stored at room temperature or refrigerated (2-30°C). 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.

SPECIMEN COLLECTION AND PREPARATION

- The Yellow Fever Virus Antigen Rapid Test Cassette (Serum/Plasma/ Whole Blood) can be tested using serum, plasma or whole blood.
- To collect Finger stick 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 Finger stick 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.
- 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 finger stick 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 federal regulations for transportation of etiologic agents.

MATERIALS

Materials provided			
• Test Cassette	• Buffer	• Dropper	• Package Insert
Materials required but not provided			
• Specimen collection container		• Centrifuge (for plasma only)	
• Micropipette		• Timer	
• Lancet (for finger stick 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.

- Bring the pouch to room temperature before opening it. Remove the test cassette from the sealed pouch and use it within 1 hour.
- Place the test cassette on a clean and level surface.

For Serum or Plasma specimen:

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.

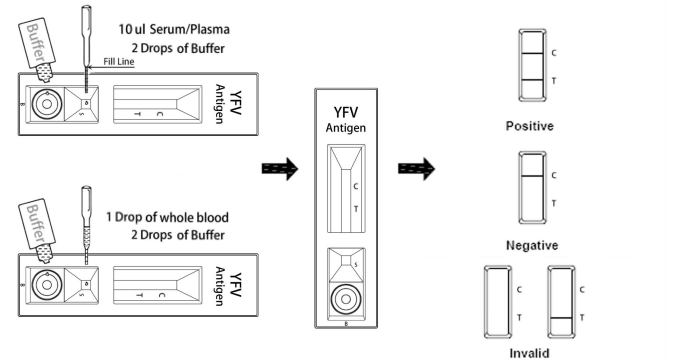
For Venipuncture Whole Blood specimen:

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

For Finger stick Whole Blood specimen:

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

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



INTERPRETATION OF RESULTS

(Please refer to the illustration above)

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 (T).

*NOTE: The intensity of the color in the test line region (T) will vary depending on the concentration of Yellow Fever Virus antigen present in the specimen. Therefore, any shade of red in the test region should be considered positive.

NEGATIVE: **One color line appears in the control region (C).** No apparent red or pink line appears in the test region (T).

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 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

- The Assay Procedure and the Assay Result Interpretation must be followed closely when testing the presence of dengue Ag in serum or plasma from individual subjects. Failure to follow the procedure may give inaccurate results.
- The Yellow Fever Virus Antigen Rapid Test Cassette (Serum/Plasma/Whole Blood) is limited to the qualitative detection of dengue Ag in human serum, plasma or whole blood. The intensity of the test band does not linearly correlate with dengue antigen titer of the specimen.
- A negative test result does not preclude the possibility of exposure to or infection with yellow fever viruses.
- A negative result can occur if the quantity of yellow fever Ag present in the specimen is below the detection limits of the assay, or the yellow fever Ag that are detected are not present during the stage of disease in which a sample is collected.
- Some specimens containing unusually high titer of heterophile antibodies or rheumatoid factor may affect expected results.
- If the symptom persists, while the result from Yellow Fever Virus Antigen Rapid Test Cassette (Serum/Plasma/Whole Blood) is negative or non-reactive result, it is recommended to re-sample the patient few days later or test with an alternative test cassette such as PCR, ELISA.
- The results obtained with this test should only be interpreted in conjunction with other diagnostic procedures and clinical findings.

PERFORMANCE CHARACTERISTICS

Clinical Sensitivity and Specificity

The Yellow Fever Virus Antigen Rapid Test Cassette (Serum/Plasma/Whole Blood) has compared with a leading commercial Yellow Fever Virus PCR Test using clinical specimens.

The results show that the relative sensitivity of the Yellow Fever Virus Antigen Rapid Test Cassette (Serum/Plasma/Whole Blood) is 95.8%, and the relative specificity is 96.1%.

Method		Yellow Fever Virus PCR Test		Total Result
Yellow Fever Virus Antigen Rapid Test Cassette (Serum/Plasma/Whole Blood)	Results	Positive	Negative	
	Positive	137	8	145
	Negative	6	200	206
Total Result		143	208	351

Relative Sensitivity: 95.80% (95%CI*: 90.95%~98.26%);

Relative Specificity: 96.15% (95%CI*: 92.47%~98.16%);

Accuracy: 96.01% (95%CI*: 93.36%~97.67%);

*Confidence Intervals

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.

BIBLIOGRAPHY

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[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
	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