Ruba IgG/IgM cassette

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REF	4217240 Ruba IgG/IgM 40 Tests
For professional use only	

Ruba IgG/IgM

A rapid one step test for the semi-quantitative detection and differentiation of antibodies (IgG and IgM) to rubella virus in human serum, plasma or whole blood.

ONE STEP

PRINCIPLE

The LINEAR Ruba IgG/IgM cassette is intended to be used by professionals as a screening test of infection with rubella virus. Any reactive result must be confirmed with alternative testing method(s) and clinical findings. Ruba IgG/IgM cassette is a lateral flow chromatographic immunoassay. The cassette consists of: 1) a burgundy colored conjugate pad containing rubella virus antigens conjugated with colloidal gold (rubella conjugates) and a control antibody conjugated with colloidal gold, 2) a nitrocellulose membrane strip containing three test lines (M, G1, G2 lines) and a control line (C line). The M line is pre-coated with mouse anti-human IgM for detection of IgM anti-rubella virus. The G1 and G2 lines are pre-coated with mouse anti-human IgG for detection of different levels of IgG virus. The C line is pre-coated with a control line antibody. When an adequate volume of test specimen and sample diluent are dispensed into the sample well, the specimen migrates by capillary action across the cassette. IgM anti-rubella virus, if present in the specimen, will bind to the rubella conjugates. The immunocomplex is then captured on the membrane by the pre-coated mouse anti-human IgM forming a burgundy colored M line, indicating an IgM anti-rubella virus positive test result. IgG anti-rubella virus, if present in the specimen, will bind to the rubella conjugates. The immunocomplex is then captured on the membrane by the pre-coated mouse anti-human IgG forming burgundy colored G1 and/or G2 test lines, indicating an IgG anti-rubella virus positive test result. An IgG anti-rubella virus titer ≥15 IU/mL produces a burgundy colored G1 test line. An IgG titer ≥250 IU/mL produces burgundy colored G1 and G2 test lines. Absence of any test lines (M, G1 or G2) suggests a negative result.

PACKAGING CONTENTS

REF 4217240 40 Ruba IgG/IgM rapid test device
40 capillary tubes (10 µL)
1 Sample diluent (5 mL)

STORAGE AND STABILITY

Store at 2-30ºC. The test device is stable through the expiration date printed on the sealed pouch. The test device must remain in the sealed pouch until use. **Do not freeze the kit or expose the kit over 30°C**. Do not uses beyond the expiration date.

SPECIMEN COLLECTION AND PREPARATION

Consider any materials of human origin as infectious and handle them using standard bio-safety procedures.

Plasma. Collect blood specimen into collection tube (EDTA, citrate or heparin, respectively in Vacutainer® by venipuncture.

1. Separate the plasma by centrifugation.
2. Carefully withdraw the plasma into new pre-labeled tube.

Serum. Collect blood specimen into a red top collection tube (contain anticoagulants in Vacutainer®) by venipuncture.

1. Allow the blood to clot. Separate the serum by centrifugation.
2. Carefully withdraw the serum into a new pre-labeled tube.

Test specimens as soon as possible. Store at 2°C-8°C if not tested immediately, up to 5 days. The specimens should be frozen at -20°C for longer storage. Avoid multiple freeze-thaw cycles. Prior to testing, bring frozen specimens to room temperature slowly and mix gently. Specimens containing visible particulate matter should be clarified by centrifugation before testing. Do not use specimens demonstrating gross lipemia, gross hemolysis or turbidity.

Whole blood. Can be obtained by fingertip puncture or venipuncture. Collect blood specimen into a lavender, blue or green top collection tube (containing EDTA, citrate or heparin, respectively in Vacutainer®). Do not use hemolyzed blood. Store at (2-8°C) if not tested immediately. The specimens must be tested within 24 hours of collection.

MATERIAL REQUIRED

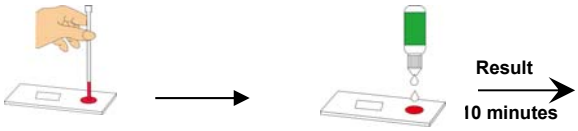
- Timer
- Lancing device for whole blood test

PROCEDURE

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

1. Remove the cassette from the sealed pouch and use it as soon as possible. Place the cassette on a clean, flat surface.
2. Be sure to label the device with specimen's ID number.
3. Fill the capillary tube with specimen not exceeding the specimen. The volume of specimen is approx. 10 µL. For better precision, use a pipette capable of delivering 10 µL.
4. Holding the capillary tube vertically, dispense the entire specimen into the center of the sample well (S) making sure that there are no air bubbles. Immediately add 2 drops (about 60-80 µL) of Sample Diluent to the sample well with bottle positioned vertically.

10 µL of serum or plasma **2 drops of sample diluent**



10 µL of whole blood **2 drops of sample diluent**

5. Set up timer.
6. Result should be read in 10 minutes. Positive results may be visible in as soon as 1 minute.

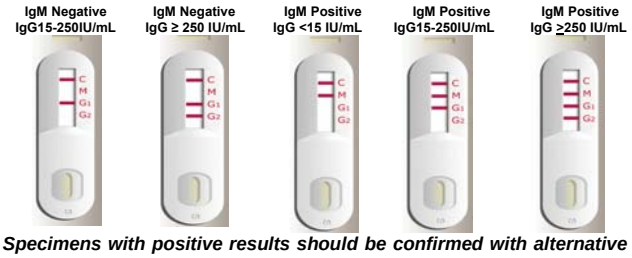
Do not read result after 15 minutes. To avoid confusion, discard the test device after interpreting the result.

INTERPRETATION OF ASSAY RESULT

NEGATIVE RESULT:

If only the C line develops, the test indicates that the levels of IgM and IgG anti-rubella virus in the specimen are below the detection limits of the assay. The result is negative or non-reactive.

POSITIVE RESULT:



Specimens with positive results should be confirmed with alternative testing method(s) and clinical findings.

Rapid Test has been calibrated against the World Health Organization 1st International Standard for anti-Rubella immunoglobulin (RUBI-1-94).

INVALID: If no C line is developed, the assay is invalid regardless of any burgundy color in the test bands as indicated below. Repeat the assay with a new device.

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QUALITY CONTROL

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

CLINICAL SIGNIFICANCE

An infection with rubella virus occurs most often during childhood. The infection usually leads to mild symptoms including maculopapular rash of head and trunk, fever, arthritis and lymphadenopathy[1]. However, if a rubella virus infection occurs during pregnancy, a group of birth defects collectively known as congenital rubella syndrome (CRS) may develop, including congenital eye defects, deafness, congenital heart diseases and mental retardation[1].

Diagnosis of Rubella is unreliable and unspecific[1]. Therefore, laboratory diagnosis is essential to confirm an acute infection. During an acute infection with rubella virus, IgM anti-rubella virus can be detected 3-6 days after onset of symptoms and generally decrease to undetectable levels within 12-14 weeks[2]. IgG anti-rubella virus can be detected within 2-3 weeks post infection and levels may rise during the acute phase of the disease to levels above 200 IU/mL[2]. Protective immunity from an infection with rubella virus is indicated by an IgG anti-rubella virus level ≥10-15 IU/mL[3,4]. However, the presence of IgG anti-rubella virus ≥10-15 IU/mL does not necessarily ensure protection from future infection with rubella virus. A patient without protective levels of IgG anti-rubella virus (<10-15 IU/mL) is considered at risk of acquiring a rubella virus infection during pregnancy[3,4]. The kit allows differentiation of high titer IgG anti-rubella virus (≥250IU/mL) from low titer IgG anti-rubella virus (≥15IU/mL and <250 IU/mL).

Expected values. IgM and IgG anti-rubella virus positive rates vary depending on the age of the population studied, the local vaccination programs. The reported IgG anti-rubella positive rates at ≥10-15 IU/mL and >200 IU/mL are 89-94% and 3.4%, respectively5-8. The reported IgM anti-rubella virus positive rate is 0.3-1.7%[7,8].

ANALYTICAL PERFORMANCE

Analytic Sensitivity of IgG Detection. Twelve groups of matrix were spiked with IgG anti-rubella virus to the WHO 1st International Standard (RUBI-1-94) concentrations of 0, 5, 10, 15, 20, 30, 60, 100, 160, 200, 250, and 300 IU/mL. The specimens were run on the Ruba IgG/IgM cassette. Defined as the 95% detection level, the limit of detection or sensitivity G1 and G2 test lines is 15 IU/mL and 250 IU/mL, respectively.

LOD for G1 test line

IgG IU/mL	0	5	10	15	20	30	60
Number Positive	0	2	13	19	20	20	20
Number Negative	20	18	7	1	0	0	0

N=20, Analytic sensitivity at 15 IU/mL = 19/20 x 100 = 95%

LOD for G2 test line

IgG IU/mL	30	60	100	160	200	250	300
Number Positive	0	4	11	13	18	20	20
Number Negative	20	16	9	7	2	0	0

N=20, Analytic sensitivity at 250 IU/mL = 20/20 x 100 = 100%

Accuracy of IgG Detection. A total of 214 specimens were collected and tested with the Ruba IgG/IgM cassette and by a commercial IgG anti-rubella virus ELISA with positive cut off level at 10 IU/mL. Comparison for all subjects is shown in the following table:

	Ruba IgG/IgM Cassette		
Reference	Positive	Negative	Total
Positive	171	3	174
Negative	2	38	40
Total	173	41	214

Relative Sensitivity: 98.3%, Relative Specificity: 95.0%, Overall Agreement: 97.7%

Among the 214 specimens, 3 specimens were detected to have IgG levels higher than 250 IU/mL. These specimens were all detected as positive on the Ruba IgG/IgM cassette G1 and G2 test line.

Positive Rate on the Random Clinical Specimens. The positive rate was evaluated with 10,000 clinical specimens. M, G1 and G2 positive rates were 0.3%, 87% and 7%, respectively.

Boston Biomedica Inc (BBI) Mixed Titer Performance Panel. The performance of the Ruba IgG/IgM and a commercially available IgM anti-rubella virus Rapid Test were evaluated using BBI Mixed Titer Performance Panel PTR-201. Results are shown in the following table:

BBI Reference Panel: Abbott EIA-Rubella	Number	Ruba IgG/IgM cassette		
		M Positive	G1 Positive	G2 Positive
IgM Positive	5	4	0	0
IgG < 15 IU/mL	2	0	0	0
15 IU/mL ≤ IgG < 250 IU/mL	14	0	14	0
IgG ≥ 250 IU/mL	9	0	9	6
Negative	20	0	0	0

Cross-Reactivity. No false positive results were observed with 4-10 specimens from the following disease stages or special conditions, respectively:

HAV	HBV	HCV	HIV	Syphilis	TB
Dengue	*H. pylori*	CMV	HSV-1	HSV-2	Toxoplasma
ANA	HAMA	RF (up to 2,500 IU/mL)			

All positive anti-rubella IgG results were confirmed with ELISA

Interference. Common substances (such as pain and fever medication and blood components) may affect the performance. This was studied by spiking these substances into negative, IgG positive and IgM positive specimens, respectively. The results demonstrate that at the concentrations tested, the substances studied do not affect the performance of the Rubella IgG/IgM.

List of potentially interfering substances and concentrations tested:

1. Albumin	60 g/L	6. Hemoglobin	2 g/L
2. Bilirubin	20 mg/dL	7. Heparin	3,000 U/L
3. Creatinine	442 µmol/L	8. Salicylic acid	4.34 mmol/L
4. EDTA	3.4 µmol/L	9.Sodiumcitrate	3.8%
5. Glucose	55 mmol/L		

LIMITATIONS OF TEST

1. The Procedure and the Interpretation of Result sections must be followed, failure to follow the procedure may lead to inaccurate results.
2. The intensity of the test line does not have linear correlation with the titer of rubella antibody in the specimen.
3. A negative or non-reactive test result does not preclude the possibility of exposure to or infection with rubella virus. A negative result can occur if the titer of rubella virus antibody present in the specimen is below the level detectable by the assay or if rubella virus antibody was not present during the stage of disease in which the sample was collected.
4. Infection may progress rapidly. If the symptom persists, while the result is negative, it is recommended to re-test the patient a few days later or test with an alternative test method.
5. The Ruba IgG/IgM cassette has not been validated on specimens from neonates.
6. Specimens from patients with infectious mononucleosis or high titers of heterophile antibodies, rheumatoid factor (>2,500IU/mL) may affect expected results.
7. The *cassette* does not differentiate antibodies generated by vaccine from that by infection.
8. Results obtained should only be interpreted in conjunction with other procedures and clinical findings.

PRECAUTIONS

1. Read the package insert completely before test. Failure to follow the insert gives inaccurate test results.
2. Do not use expired devices.
3. Do not use the components in any other type of test kit as a substitute for the components in this kit.
4. Wear protective clothing and disposable gloves while handling the kit reagents and clinical specimens. Wash hands thoroughly after performing the test.
5. Users of this test should follow the US CDC Universal Precautions for prevention of transmission of HIV, HBV and other blood-borne pathogens.
6. Do not smoke, drink or eat in areas where specimens or kit reagents are being handled.
7. Dispose of all specimens and materials used to perform the test as bio-hazardous waste. Handle the negative and positive controls in the same manner as patient specimens.
8. Do not perform the test in a room with strong air flow, i.e. an electric fan or strong air conditioning.

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