

BioSign® Rubella

New One-Step Anti-Rubella Virus Antibody (IgG) Test

For Professional Use

Immunoassay for the Qualitative Detection of Anti-Rubella Virus Antibody (IgG) in Human Serum or Plasma

PBM

| | | |
|-------------|------------|-------------|
| Catalog No. | BSP-171-35 | 35 Test Kit |
| | BSP-171-10 | 10 Test Kit |

Intended Use

BioSign® Rubella test qualitatively detects anti-rubella virus antibody (IgG) in human serum or plasma specimens. The test is intended for use as an indicator of immune status or for confirmation of recent rubella infection.

Summary and Principle of Procedure

Rubella (German measles) is a benign, self-limiting disease, usually of childhood, which is characterized by mild upper respiratory symptoms, suboccipital lymphadenopathy, and an erythematous rash. Mild complications of arthralgias and arthritis may occur after the disappearance of rash in young adults¹. Over the past 15 years, the administration of an attenuated rubella virus to prime target populations susceptible to the disease has markedly reduced the natural incidence of rubella infection². At the present time the prime indication for laboratory diagnosis of rubella resides in the potential risk of this disease to the fetuses of women in the early stages of pregnancy³. If contracted during the first trimester of pregnancy, the virus may produce a severe infection in the fetus resulting in multiple abnormalities referred to as congenital rubella syndrome. Additional consequences of rubella infection may include spontaneous abortion of the fetus, miscarriage, or still birth⁴. It is recommended that women of childbearing age should be assessed by antibody analysis for susceptibility to rubella; those found susceptible should be vaccinated with due regard taken for the potential dangers of vaccination during pregnancy^{1,5}.

BioSign® Rubella—One Step Anti-Rubella IgG Test uses a solid-phase immunochromatographic assay technology for the qualitative detection of anti-rubella virus antibodies (IgG class) in human serum or plasma. In the test procedure, 10 µl of serum or plasma sample is spotted in the sample well (S) located below the test window. If any anti-rubella virus antibody is present in the sample, it will be captured by the rubella antigen band impregnated in the test membrane. The developer solution is then added in the solution well (D). As the specimen followed by the developer solution moves by capillary action to the antigen band, the solution mobilizes the dye conjugated to anti-human IgG antibodies. Visualization of the antigen band in

the test window will occur only when the antibody-dye conjugate binds to the anti-rubella virus antibody which has been bound to the rubella antigen. As the antibody-dye conjugate continues to move along the test membrane, it will bind to another band located in the control window to generate a colored band regardless of the presence of anti-rubella virus antibodies in the sample. Therefore, the presence of two colored bands, one in the test window and the other in the control window, indicates a positive result, while the absence of a colored band in the test window indicates a negative result.

Reagents

Materials Provided

- **BioSign® Rubella** test device containing a membrane strip coated with inactive rubella antigen and a pad impregnated with a monoclonal anti-human IgG-dye conjugate in a protein matrix containing 0.1% sodium azide.
- Developer Solution containing 0.1% sodium azide in phosphate-saline buffer in a dropper bottle.
- Directions for Use

Materials Required but Not Provided

- Vacutainer tubes for serum or plasma preparation
- Centrifuge
- Specimen pipette (10 µl) or micropipette tip
- Micropipettor (0-200 µl)

Precautions

- For *in vitro* diagnostic use only.
- Do not interchange materials from different lots and do not use beyond the expiration date.
- Use a fresh micropipette tip for each serum or plasma specimen.
- Do not smoke, eat or drink in areas in which specimens or kit reagents are handled.
- Wear disposable gloves while handling kit reagents or specimens and wash hands thoroughly afterwards.
- All patient samples should be handled as if they are capable of transmitting disease. Observe established precautions against microbiological hazards throughout all procedures and follow the standard procedures for proper disposal of specimens.
- Reagents in this kit contain sodium azide as a preservative, which may react with lead or copper in plumbing to form potentially explosive metal azides. Upon disposal, always flush with large volumes of water to prevent azide buildup in drains.
- **BioSign® Rubella** device should remain in its sealed pouch until ready for use.

Storage and Stability

BioSign™ Rubella test kit is to be stored at 4–30°C (40–86°F) in the sealed pouch. The storage conditions and stability dating given were established under these conditions.

Specimen Collection and Preparation

- **BioSign™ Rubella** test can be performed on serum or plasma. Sodium citrate, heparin or EDTA may be used as an anticoagulant. Use of other anticoagulants has not been established.
- Remove the serum or plasma from the clot of red cells as soon as possible to avoid hemolysis. Only clear, non-hemolyzed specimens should be used.
- Specimens containing any particulate matter may give inconsistent test results. Such specimens should be clarified by centrifugation before testing.
- If specimens are to be stored, they should be refrigerated at 2–8 °C or frozen. For prolonged storage, samples should be frozen and stored below -20 °C. Specimens should not be repeatedly frozen and thawed.
- Bring specimens to room temperature prior to testing. The frozen specimens must be completely thawed and thoroughly mixed.
- If specimens are to be shipped, they should be packed in compliance with federal regulations covering the transportation of etiologic agents.

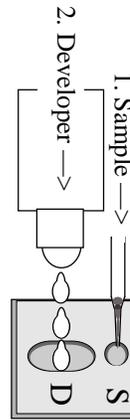
Procedure

Procedural Notes

The instructions below must be followed to achieve optimal test reactivity with serum or plasma specimens. Follow the assay procedure and always perform the test under carefully standardized conditions.

- If specimens, kit reagents or **BioSign™** devices have been stored in the refrigerator, allow them to warm to room temperature before testing.
- Do not open the foil pouch until you are ready to perform the test.
- Several tests may be run at one time.
- To avoid cross-contamination, use a new disposable micropipette tip for each specimen.
- To avoid contamination, do not touch the tip of the Developer Solution bottle with your hands or to the device.
- Label the device with the patient ID or control number.
- When 10 µl of specimen is dispensed using a micropipette, allow the tip of the micropipette to touch lightly to the pad underneath the sample well (S) and dispense the contents.
- To add Developer Solution, hold the dropper bottle in a vertical position above the solution well (D) and dispense 3–4 drops into the well.

Test Protocol



1. Add 10 µl of serum or plasma in the sample well (S).
2. Add 3-4 drops of Developer Solution in the solution well (D).
3. Read the result in 6 to 10 minutes.

- After testing, dispose of the **BioSign™** device and the specimen dispenser following good laboratory practices. Consider each material that comes into contact with specimen to be potentially infectious.
- Read within 30 minutes after the addition of Developer Solution.

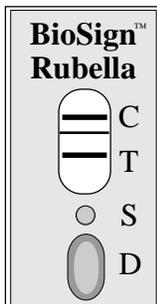
Interpretation of Results

Positive: Two colored bands, one in the test window and one in the control window, indicate that IgG antibodies against rubella virus have been detected.

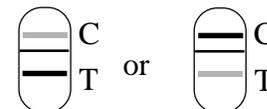
Note: The test result can be read as soon as a distinct pink-purple band appears in the test window. The test band will appear before the control band in most of the strong positive cases. The test band may appear after the control band in weak positive cases, and the control band may be darker than the test band. The three possible positive cases, therefore, are:

- a. Two strong colored bands, one in the test window (T) and one in the control (C) window.
- b. One strong colored band in the test window (T) and one light colored band in the control window (C).
- c. One light colored band in the test window (T) and one strong colored band in the control window (C).

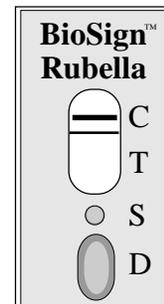
Negative: Only one colored band in the control window (C), with no distinct colored band in the test window other than the normal faint



2 Bands = **Positive (+)**



1 Band = **Negative (-)**



background color, indicates that IgG antibodies against rubella virus have not been detected.

Invalid: A distinctive colored band in the control window should always appear. The test is invalid if no band forms in the control window.

Limitations

- The results obtained by this kit yield data that must be used only as adjunct to other information available to the physician.
- Specimens taken very early during the acute phase of infection with rubella virus may contain only IgM antibodies⁶ and, therefore, be negative by this procedure. **BioSign™ Rubella** is a qualitative test for the detection of IgG antibodies against rubella virus.
- The amount of antibody necessary for an individual to be immune from rubella reinfection has not been firmly established⁷. However, a person with a weak positive result who is a candidate for vaccination may be retested using a second technique for a quantitative result.
- Appropriate timed and paired specimens may be used to determine recent infection⁸. Significant changes in the intensity of the test band may occur during the timed period. However, it may be useful in difficult cases to use a second technique such as a hemagglutination inhibition test for confirmation.

User Quality Control

A quality control check should be made daily using commercially available control sera. A quality control test using positive and negative control standards should be performed as good testing practice and to confirm the expected Q.C. results. The positive control will produce a moderate positive result. The negative control will yield a negative result (control band only). Upon confirmation of the expected results, the kit is ready for use with patient specimens. For information about the commercially available controls and other assistance, contact PBM's technical services.

A colored band in the control window (C) can be considered an internal procedural control. If the test has been performed correctly and the device is working properly, a distinct colored band will always appear. If a test result is not clear, a new test should be performed. If the problem persists, contact PBM's technical services for assistance.

Expected Values

1. Immune Status

The presence of anti-rubella virus antibody (IgG class) indicates previous exposure to the virus. Antibody titers of 8 or greater by the hemagglutination-inhibition (HAI) assay indicate past rubella infection and thus immunity to primary infection⁹. **BioSign™ Rubella** is capable of detecting antibody titers of 8 or greater as determined by the HAI assay.

2. Recent or active infection

BioSign™ Rubella test can be used with paired specimens collected at proper intervals to determine recent rubella infection. Timing of sample collection is critical. The seroconversion

characteristic of recent or active infection may not be seen if the first (acute phase) sample is taken too late or if the second (convalescent phase) sample is taken too early. The acute phase specimen should be collected as early as possible from the time of exposure or within seven days after the onset of symptoms. The convalescent phase specimen should be taken at least 14 days after the first sample and not earlier than 10 days after the onset of symptoms¹⁰. If no clinical symptoms occur, collect a specimen at least 30 days after exposure. Both the acute and convalescent specimens should be tested simultaneously. Significant changes in the test band intensity or in the timing of the test band appearance will occur in the case of seroconversion.

Performance Characteristics

A total of 612 blind clinical samples were assayed for IgG against Rubella virus with **BioSign™ Rubella** and with a commercially available latex agglutination test (Rubascan®) or with Rubazyme®. **BioSign™ Rubella** test demonstrated a relative sensitivity of 98.9% (437/442) and relative specificity of 100% (169/170) when compared with the reference test (see Table 1 below). The overall accuracy was 99.0% (606/612).

Table 1

BioSign™ Rubella vs. Reference Test

| | | BioSign™ Rubella | | Total |
|----------------|--------------|------------------|----------|-------|
| | | Positive | Negative | |
| Reference Test | Positive (+) | 437 | 5 | 442 |
| | Negative (-) | 1 | 169 | 170 |
| Total | | 438 | 174 | 612 |

Proficiency Evaluation

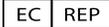
An intra-laboratory reproducibility study or test proficiency evaluation was performed using 3 lots of devices at 3 locations for a total of 90 tests. At each location, 5 positive and 5 negative samples were used for testing of the 3 lots. The results obtained at each site agreed 100% with the expected results. An intra-assay study was conducted using 3 lots in 3-day testing for both negative and positive results of 1:8 titer. The results obtained agreed 100% with expected results.

References

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Symbols Key

| | |
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|  | Manufactured by |
|  | CE Mark |
|  | Authorized Representative |
|  | In Vitro Diagnostic Medical Device |
|  | Catalog Number |
|  | Consult Instructions for Use |
|  | Batch Code |
|  | “Use By” date in year-month-day format |
|  | |
|  | Temperature Limitation |
|  | Contains sufficient for <n> tests |
|  | Do not reuse |
|  | Contents |
|  | Test Device |
|  | Developer Solution |
|  | Instructions for Use |
|  | Rubella Test |

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Patent No.: 5,559,041



© 2000 PBM
 Printed in U.S.A.
 Revised Oct 2003
 P-5203-B 1030BL



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