

Syfacard-R : Rapid plasma reagin card test / Murex.

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Syfacard-R®

Rapid plasma reagin card test

Intended Use

Syfacard-R is a rapid plasma reagin test for the qualitative and semi-quantitative measurement of reagin (antibodies directed against syphilis components) in serum or plasma.

Summary and Explanation of the Test

Syphilis is a sexually transmitted disease caused by the spirochete *Treponema pallidum*. Infection with *T. pallidum* causes the production of antibodies with distinct specificities – reagins.

1. Antigenic antibodies. This type of antibody is produced as a result of the tissue damage which occurs in syphilis and is directed against tissue components. These antibodies are generally referred to as reagins, and are detected using tests such as the Venereal Disease Research Laboratory (VDRL) test, the Rapid Plasma Reagin (RPR) test or the Automated Reagin test (ART).

Occasionally levels of reagin fall as a result of successful treatment of the disease and therefore can be used to assess the efficacy of any therapy applied. The test tube is used as a reader for the turbidity of the reaction between treatment¹.

2. Group antitreponemal antibodies. These are typically detected using the faster protein complement fixation (RPF) test. Since *T. pallidum* shares antigens with other treponemes and some penicillins, antibody titres against these common antigens generally rise when there is a syphilis, treponemal infection.

3. Specific antitreponemal antibodies. These are detected using *T. pallidum* or antigen reagent from T. pallidum in one of three test procedures:

a) *T. pallidum* immobilisation test (TPI)

b) Adsorbed fluorescent treponemal antibody test (FTA – ABS)

c) *T. pallidum* haemagglutination test (TPHA)

Syfacard-R is a RPR test.

Principle of the Procedure

The Syfacard-R test detects circulating reagin using an RPR method. The test is similar in principle to the VDRL test, which employs an antigen that is not antigenic enough. VDRL antigen is a purified suspension of the tissue fluid antigen, which, in the presence of a relatively quantity of chlamydomonas, forms a reaction in the presence of reagin. The antigen provided with the Syfacard-R kit also contains micro-particulate carbon which enhances the effect of the reagin in suspension between a positive and negative reaction, making the test easier to read.

Reagents

Kit Contents

	VD02 100 tests	VD03 500 tests
1. Agglutinating Antigen	1 bottle (316)	2 bottles (216 each)
2. Dispensing Bottle	1 bottle	2 bottles
3. Dispensing Needle	1 needle	1 needle
4. Reaction Cards (Spirax) ¹	15 cards	60 cards
5. Disposable Sample Dispenser ²	100	500

¹ Additional Reaction Cards may be obtained from Product Code RFD 04.

Reagents, Preparation for Use and Recommended Storage Conditions

Additional Reagents: Preparation for Use and Recommended Storage Conditions

1. Agglutinating Antigen: 1 (VD02) or 2 (VD03) bottles containing balanced quantities of cardiolipin, cholesterol, and an emulsifier (cardiolipin).

When the Agglutinating Antigen is first required for use, gently shake the bottle and transfer the content to the plastic Dispensing Bottle provided. To Mix the Dispensing Bottle, remove the screw cap, pull out the Dispensing Needle and transfer the reagent with a clean Pasteur pipette.

Reinsert the cap, stopper and apply the Dispensing Needle firmly to the tip.

After any testing, the needle should be removed from the Dispensing Bottle, rinsed clean with distilled water, and dried. This step should be repeated on the Dispensing Bottle during storage of the antigen.

The Agglutinating Antigen should be stored at 2 to 8°C. While in the original bottle provided in the kit, the Agglutinating Antigen will remain fully reactive until the date shown on the bottle label. After transfer to the plastic Dispensing Bottle, the Agglutinating Antigen is stable for 3 months at 2 to 8°C. On the date shown on the original bottle label, whichever is the shorter, if a longer life than 3 months is required, the Agglutinating Antigen may be returned to the original glass bottle after use. In this case the Dispensing Bottle and the needle must be thoroughly rinsed with distilled water and dried before further use. DO NOT FREEZE.

NOTE:

1. Continuing to use the syringe on the needle sheath, do NOT discard the needle until the antigen has either been used up or reached its expiry date.

2. After several uses the needle may become discoloured. This does not affect the performance of the test.

Warnings and Precautions

Health and Safety Information

1. The reagent is for in vitro diagnostic use only.

2. Do not point by mouth. Wear disposable gloves and eye protection while handling specimens and performing the test. Wash hands thoroughly when finished.

3. In accordance with the principles of Good Laboratory Practice it is strongly recommended that all human-based materials including patients' samples should be handled as though potentially infectious and used with all necessary precautions.

4. Non-disposable apparatus should be identified by an appropriate procedure after use and with the preferred method to destroy for 1 hour at 121°C, disposables should be incinerated. Spillages of reagent samples should be removed with absorbent paper tissue and the contaminated area washed with, for example, 10% sodium hypochlorite before use is resumed. Materials used to clean spills, including gloves, should be disposed of as potentially biohazardous waste. Do not autoclave waste containing sodium hypochlorite.

5. The Agglutinating Antigen contains thiomersal. Although the concentration is low, thiomersal is known to be toxic by ingestion, inhalation and skin contact. Avoid ingestion and personal contact after use, wearing appropriate personal protection. If the reagent comes into contact with the skin or eyes, it should be removed immediately by rinsing with plenty of water.

Analytical Precautions

1. Allow the reagent to warm to room temperature and the Agglutinating Antigen to reach room temperature before testing. The best results will be obtained if the test is carried out at a temperature in the range 22 to 28°C. The sensitivity of the test may be reduced at lower temperatures¹.

2. Gently shake the bottle of Agglutinating Antigen to ensure an even suspension before use.

3. The Dispensing Needle is calibrated to deliver 10 µl drops of antigen. The accuracy of delivery may be checked according to the procedure described in the Manual of Tests for Syphilis¹.

4. Do not use the reagent beyond the stated expiry date. Microbiological contamination of the reagent will be avoided as this may reduce the effect of the product and cause erroneous results.

5. Do not touch the reaction areas on the cards.

6. The test area on the Reaction Cards must not be used. If desired, the cards may be dried and used as a permanent record of the results after the test has been completed.

Specimen Collection and Storage

Serum and plasma samples may be used. Blood collected by venipuncture should be allowed to clot naturally. When the blood has fully clotted the serum should be removed from the clot. Any visible particulate matter in the serum or plasma sample should be removed by centrifugation prior to testing.

If the sample cannot be tested on the day of collection it should be stored at 2 to 8°C. Samples not required for testing after 48 hours should be stored at -18 to -20°C. The use of *high* temperature samples, *improperly* collected sera, plasma samples containing fibrin clots or bacteriologically contaminated samples may lead to false positive results.

Procedure

Materials Provided

Not Provided

For Qualitative and Semi-Quantitative Tests

1. Antigenic reagent

2. Pasteur pipette

3. For the Semi-Quantitative Test Only

1. Microcentrifuge

2. Physiological saline (0.85% NaCl)

Test Procedure

It is recommended that the section on Analytical Precautions is read carefully before performing the test.

Qualitative Test

STEP 1 Add **ONE DROP OF AGGLUTINATING ANTIGEN** to gently shaking the dispensing bottle. Place the Dispensing Bottle firmly on the Lint Top. Insert the Dispensing Needle gently to remove air bubbles from the dispensing system. Holding the bottle and needle vertically at 60° to the reaction card, place **ONE DROP OF AGGLUTINATING ANTIGEN** in each reaction circle on the card. A 10 µl microcentrifuge with disposable tips may also be used for this purpose.



STEP 2 Using the Disposable Sample Dispenser Mixers provided, **ADD ONE DROP OF SAMPLE** to each reaction circle containing antigen. Thoroughly mix the sample and antigen. A 10 µl microcentrifuge may be used to dispense the sample.

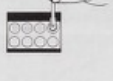


STEP 3 **MIX** the sample and Agglutinating antigen using the stirrer and the Dispenser mixer, and spread mixture over the full area of the circle. Discard the dispenser mixer. Repeat steps 2 and 3 on the next sample.



STEP 4 **ROCK** the Reaction Card using the mechanical rotor for 30 SECONDS.

STEP 5 Immediately after this 30-second mixing, **READ** the results by visual inspection in good light. No major fluctuations in response. **See Reading the Results.**



In Semi-Quantitative Test

STEP 1 Add **ONE DROP OF Disposable Sample Dispenser Mixers** provided to a 20 µl microcentrifuge. **DISPENSE** 10 µl of saline into each of 4 positions on the Reaction Card.

The Syfacard-R test is a titration procedure. It is recommended that the section on Analytical Precautions is read carefully before performing the test.

STEP 2 Using the microcentrifuge **ADD 50 µl of the SAMPLE** to the saline in the first circle.



STEP 3 Using the same pipette **MIX** the saline with the sample by aspirating continuously or over the fluid several times and **TRANSFER** 10 µl to the saline in the second circle.



STEP 4 Perform serial dilutions in a similar manner up to the fourth circle, and finally discard 10 µl from this. The dilution series will be approximately as follows:



STEP 5 Place **ONE DROP OF AGGLUTINATING ANTIGEN** next to each sample dilution as described in STEP 1.

Qualitative Test – stage 4. A 10 µl microcentrifuge with disposable tips may also be used for this purpose.



STEP 6 Using a separate dispenser mixer for each circle, **MIX** and spread the sample dilutions and antigen over the full area of the circle as described with the most dilute, use the same dispenser mixer.



Continue as described in STEPS 4 and 5 for the Qualitative Test.

The titre is reported as the highest dilution which shows a positive result. It is cases where a positive result is obtained with a 1:16 dilution, the end point may be determined by starting with a preliminary 1:32 dilution of the sample in saline, making a further dilution series in a manner similar to that described above, and repeating the test procedure. The first dilution in the series will be approximately 1:16.

Quality Control

A supply of characterised reagent and non-reactive samples should be maintained for control purposes. Each run of tests should include parallel tests on control samples, and these must give the expected pattern of reactivity for the results to be valid.

Results

Positive Results

A positive result is indicated by the development of clearly visible clumps of the black particles. In negative result you may find the carbon particles remain in suspension and no agglutination is visible.

Negative Results

A negative result is indicated by the development of clearly visible clumps of the black particles. In negative result you may find the carbon particles remain in suspension and no agglutination is visible.

Semi-Quantitative Procedure

As a result of effective treatment, titres of reagin fall usually becoming negative in some stages of syphilis infection a negative result may be obtained. (See Limitations of the Procedure – below).

Limitations of the Procedure

1. Since reactivity in non-treponemal tests for syphilis, including Syfacard-R, is a result of tissue damage, false negative results may occur in stages of the disease where tissue damage is minimal. This is particularly true in early primary infections and during latent stages¹.

2. Non-specific conditions which result in tissue damage may also give rise to high-titre antibodies which react in tests such as Syfacard-R. This type of reaction is commonly called the Biological False Positive (BFP) reaction and has been reported in patients with autoimmune diseases, viral infections, malaria, leprosy, yaws and a wide variety of other conditions including pregnancy².

3. Patient samples containing excess potassium oxalate or sodium fluoride may yield uninterpretable results.

4. In some syphilis there may be no detectable of the reagin in the following subsequent treatment³.

5. It has been reported that approximately 1% of patients with secondary syphilis will give a negative result in the VDRL test if undiluted serum is used. This was due to a prozone effect. On dilution the serological response was typically restored⁴.

6. Patients infected with Human Immunodeficiency Virus (HIV) may fail to show typical serological responses in syphilis infection⁵.

Specific Performance Characteristics

The hundred unselected sera from a clinical microbiology laboratory were tested by Syfacard-R parallel with an alternative RPR test and a TPHA test. Both the latter tests were well validated commercial products from non-independent manufacturers. Samples that gave a positive result by any of these methods were also tested by a FTA – ABS test. Most of the sera which gave negative results on all tests. Twenty five sera gave positive results in both the RPR and FTA – ABS tests. Of these, 17 gave positive results on the Syfacard-R test, and 7 were positive in the alternative RPR test. Four sera were positive in either TPHA or FTA – ABS test, and five of these were detected by Syfacard-R. All were negative in the alternative RPR test. Four other sera were positive only in the Syfacard-R test.

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² Type 100

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⁴ Type 100

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