Access®
Immunoassay Systems

RUBELLA IgM

REF A32937

Intended Use

The Access Rubella IgM assay is a paramagnetic particle, chemiluminescent immunoassay for the qualitative detection of anti-Rubella virus IgM in human serum using the Access Immunoassay Systems.

Summary and Explanation

Rubella virus is a member of the Togavirus family. In contrast to the majority of togaviruses, rubella virus has no known invertebrate host. Man is the only known natural reservoir for the rubella virus.[1]

The rubella virus is spread through inhalation of virus-containing droplets from the respiratory secretions of infected persons.[2] Following transmission, the rubella virus replicates in the mucosa of the upper respiratory tract and the lymphoid tissue of the nasopharynx. Rubella virus replication in these tissues causes prodromal enlargement of the posterior and occipital lymph nodes, which typically begins 5–10 days before the onset of a rash.[1,3] Rubella virus is spread via the lymphatics and/or through a transient viremia.[3] Following an incubation period of 7–9 days, the virus appears in serum and is shed into the nasopharynx and stool. A maculopapular rash appears at 16–21 days after natural exposure. Viremia is no longer detectable at this stage of disease, which coincides with the appearance of detectable circulating antibodies. Mononuclear cell-borne viremia and virus in nasopharyngeal secretions, however, can be detected for a week or longer following disappearance of the rash.[1,3] Rubella virus infection in children or adults is typically mild. Rubella infection is characterized by a combination of symptoms that may include a maculopapular rash, lymphadenopathy, fever, conjunctivitis, sore throat, and joint pain.[1,3] In the majority of cases, the rash is the first symptom to present, appearing on the face and rapidly spreading to the trunk, arms, and legs. The rash normally disappears in one to three days. In rare cases, arthropathy, thrombocytopenia, and encephalopathy may occur.[1,3]

The level of severity associated with rubella virus infection is primarily governed by age. Postnatal rubella is generally a harmless infection. Disease in children tends to be milder than disease in adults. The fetus, however, is at high risk of developing severe, lasting rubella-induced complications if infection occurs via the placenta during maternal rubella infection in early pregnancy.[2] Such intrauterine infections, particularly during the first four months of pregnancy, can lead to Congenital Rubella Syndrome with consequences that may include deafness, cardiac problems, cataracts or glaucoma, and fetal death. The effects on the fetus vary based on the time of infection. Generally, the younger the fetus, the more severe the disease.[2,3]

An effective rubella vaccine has been available since the late 1960s. Comprehensive vaccination programs utilized in the U.S. and other countries have been successful in reducing the incidence of natural rubella. Alternate vaccination strategies in other countries have not been as successful, however, and some countries continue to be affected by the occurrence of natural rubella infection.[1]

The diagnosis of an acute rubella virus infection is based on several clinical and serological parameters.

- The presence of IgM and/or IgG class antibodies.
- A significant increase in the titer of anti-rubella virus IgG between two samples collected at an interval of at least two weeks.
- The appearance of classical symptoms, especially the well-defined rash.

The main indications for the detection of specific IgM are:

- An aid in the determination of an acute rubella virus infection.
- Follow-up of pregnant women without protective antibodies (IgG to the rubella virus), since rubella virus infections are often clinically unapparent. The serological follow-up may allow the early detection of a seroconversion and the potential infection of the fetus.

Principles of the Procedure

The Access Rubella IgM assay is an immunoenzymatic assay that utilizes the immunocapture principle. A sample is added to a reaction vessel with paramagnetic particles coated with polyclonal antibody to human IgM (sheep). After incubation, materials bound to the solid phase are held in a magnetic field while unbound materials are washed away. In the second incubation a complex of rubella virus antigen and Rubella specific monoclonal antibody labeled with alkaline phosphatase is added to the reaction vessel. After the incubation and washing step, the chemiluminescent substrate Lumi-Phos* 530 is added to the vessel and light generated by the reaction is measured with a luminometer. The light production is proportional to the amount of enzyme conjugate present at the end of the reaction. The presence of specific IgM in the sample is determined by means of a fitted multi-point calibration curve standardized against a clinically defined reference preparation (titration in hemagglutination inhibition test (HAI) after ultracentrifugation).

The curve is expressed in arbitrary units (AU/mL). The valid calibration curve remains stored on the instrument.

Product Information

Access Rubella IgM Reagent Pack
Cat. No. A32937: 100 determinations, 2 packs, 50 tests/pack

- Provided ready to use.
- Store upright and refrigerate at 2 to 10°C.
- Refrigerate at 2 to 10°C for a minimum of two hours before use on the instrument.
- Stable until the expiration date stated on the label when stored at 2 to 10°C.
- Stable at 2 to 10°C for 28 days after initial use.
- Signs of possible deterioration are a broken elastomeric layer on the pack or control values out of range.
- If the reagent pack is damaged (i.e., broken elastomer), discard the pack.

R1a:	Paramagnetic particles coated with a polyclonal anti-human IgM antibody (sheep) suspended in TRIS buffered saline, with surfactant, proteins (bovine), < 0.1% sodium azide, and 0.1% ProClin** 300.
R1b:	Inactivated rubella antigen - monoclonal antibody (mouse) to Rubella virus complex/alkaline phosphatase (bovine) conjugate in TRIS buffered saline with surfactant, proteins (bovine, murine), < 0.1% sodium azide, and 0.3% ProClin 300.
R1c:	TRIS buffered saline with surfactant, < 0.1% sodium azide and 0.1% ProClin 300.
R1d:	Diluent: TRIS buffered saline with surfactant, proteins (bovine, human), < 0.1% sodium azide, and 0.2% ProClin 300.
R1e:	Diluent: TRIS buffered saline with surfactant, proteins (bovine, human), < 0.1% sodium azide, and 0.2% ProClin 300.

Note: Rubella virus antigen has been chemically inactivated (agent: β-propiolactone)

Warnings and Precautions

- For *in vitro* diagnostic use.
- Patient samples and blood-derived products may be routinely processed with minimum risk using the procedure described. However, handle these products as potentially infectious according to universal precautions and good clinical laboratory practices, regardless of their origin, treatment, or prior certification. Use an appropriate disinfectant for decontamination. Store and dispose of these materials and their containers in accordance with local regulations and guidelines.
- Human source material used in the preparation of the reagent has been tested and found negative or non-reactive for Hepatitis B, Hepatitis C (HCV), and Human Immunodeficiency Virus (HIV-1 and HIV-2). Because no known test method can offer complete assurance that infectious agents are absent, handle reagents and patient samples as if capable of transmitting infectious disease.[4]
- Sodium azide may react with lead and copper plumbing to form highly explosive metal azides. On disposal of liquids, flush with a large volume of water to prevent azide build-up.[5]
- Xi. Irritant: 0.3% ProClin 300.

R 43: May cause sensitization by skin contact.
S 28-37: After contact with skin, wash immediately with plenty of soap and water. Wear suitable gloves.

- The Material Safety Data Sheet (MSDS) is available upon request.

Specimen Collection and Preparation

1. Serum is the recommended sample.
2. Observe the following recommendations for handling, processing, and storing blood samples:[6]
   - Collect all blood samples observing routine precautions for venipuncture.
   - Allow serum samples to clot completely before centrifugation.
   - Centrifuge the samples.
   - Keep tubes stoppered at all times.
   - Store samples tightly stoppered at room temperature (20 to 25°C) for no longer than eight hours.
   - If the assay will not be completed within eight hours, refrigerate the samples at 2 to 8°C.
   - If the assay will not be completed within 48 hours, or for shipment of samples, freeze at -20°C or colder.
3. Use the following guidelines when preparing specimens:
   - In general, allow 1 hour for serum samples to clot completely.
   - All samples stored longer than 8 hours should be centrifuged at 3000 g for 15 minutes prior to testing.
   - Follow blood collection tube manufacturer's recommendations or validated laboratory procedures for centrifugation.
4. Ensure fibrin and cellular matter have been removed prior to analysis. Turbid serum samples containing particulate matter should be transferred from the original tube and re-centrifuged prior to assay. A specimen (original tube) that contains a separating device (gel barrier) is never to be re-centrifuged.[6]
5. Avoid repeated freezing and thawing of samples. Thaw samples no more than four times.
6. Avoid using grossly hemolyzed or cloudy samples.
7. Avoid the use of heat treated samples.

Materials Provided

R1 Access Rubella IgM Reagent Packs

Materials Required But Not Provided

1. Access Rubella IgM Calibrators
   Provided at zero and approximately 5, 15 and 60 AU/mL.
   Cat. No. 34445
2. Access Rubella IgM Quality Control (QC) or other commercially available quality control material.
   Cat. No. 34449
3. Access Substrate
   Cat. No. 81906
4. **Access, Access 2, SYNCHRON LX®i:**
   Access Wash Buffer II, Cat. No. A16792
   UniCel® DxI:
   UniCel DxI Wash Buffer II, Cat. No. A16793

Procedural Comments

1. Refer to the appropriate system manuals and/or Help system for a specific description of installation, start-up, principles of operation, system performance characteristics, operating instructions, calibration procedures, operational limitations and precautions, hazards, maintenance, and troubleshooting.
2. Mix contents of new (unpunctured) reagent packs by gently inverting pack several times before loading on the instrument. Do not invert open (punctured) packs.
3. Use twenty (20) µL of sample for each determination in addition to the sample container and system dead volumes. Refer to the appropriate system manuals and/or Help system for the minimum sample volume required.
4. The first result is obtained in 75 minutes.

Procedure

Refer to the appropriate system manuals and/or Help system for information on managing samples, configuring tests, requesting tests, and reviewing test results.

Calibration Details

An active calibration curve is required for all tests. For the Access Rubella IgM assay, calibration is required every 28 days. Refer to the appropriate system manuals and/or Help system for information on calibration theory, configuring calibrators, calibrator test request entry, and reviewing calibration data.

Quality Control

Quality control materials simulate the characteristics of patient samples and are essential for monitoring the system performance of immunochemical assays. Because samples can be processed at any time in a "random access" format rather than a "batch" format, quality control materials should be included in each 24-hour time period.[7] Include Access Rubella IgM QC or other commercially available quality control materials that cover at least two levels of analyte. Follow manufacturer's instructions for reconstitution and storage. Each laboratory should establish mean values and acceptable ranges to assure proper performance. Quality control results that do not fall within acceptable ranges may indicate invalid test results. Examine all test results generated since obtaining the last acceptable quality control test point for this analyte. Refer to the appropriate system manuals and/or Help system for information about reviewing quality control results.

Results

Patient test results are determined automatically by the system software using a smoothing spline math model. The amount of analyte in the sample is determined from the measured light production by means of the stored calibration data. Patient test results can be reviewed using the appropriate screen. Refer to the appropriate system manuals and/or Help system for complete instructions on reviewing sample results.

Note: Results are expressed in arbitrary units (AU/mL).