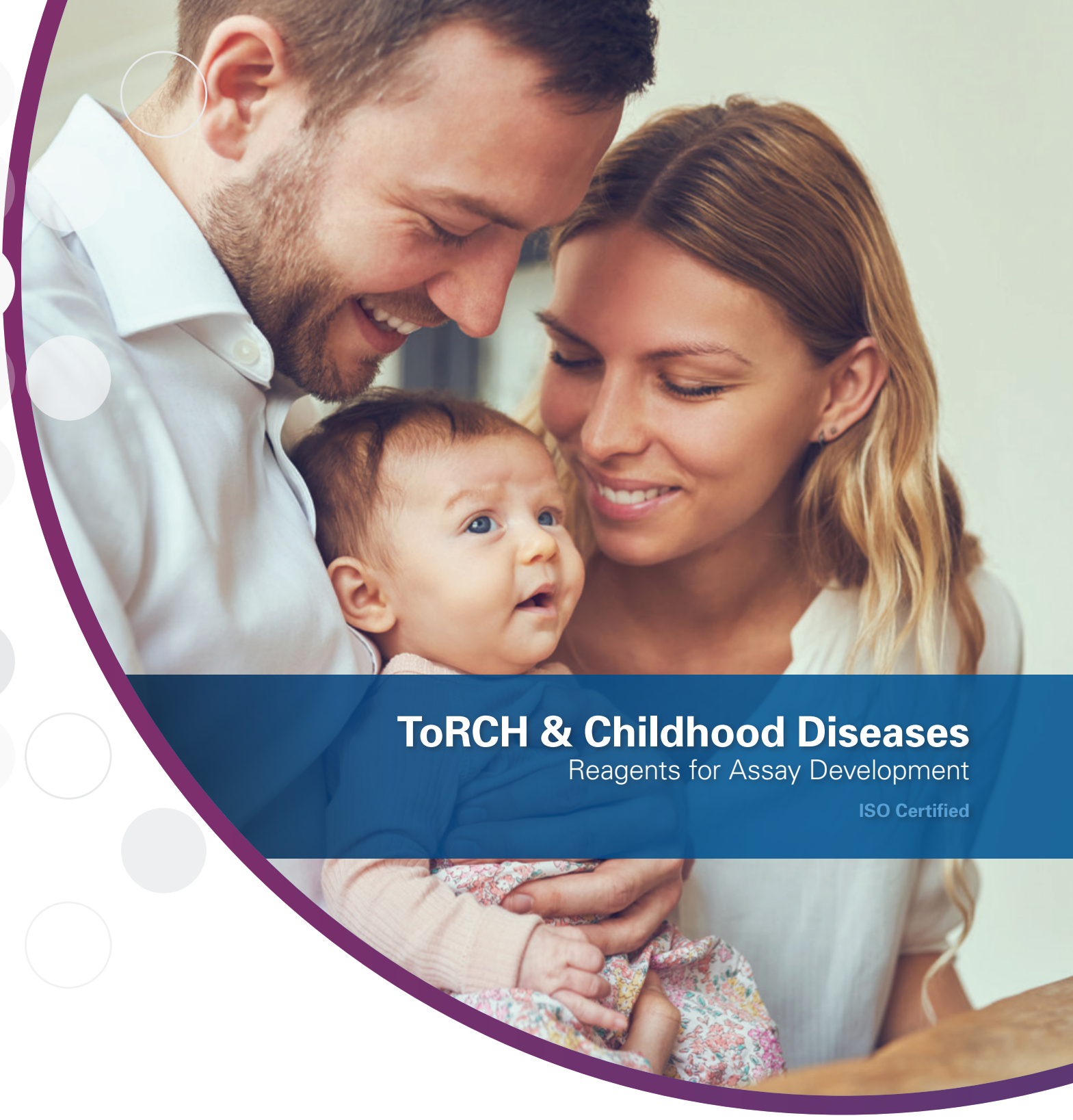


ToRCH & Childhood Diseases

Reagents for Assay Development

ISO Certified

meridian BIOSCIENCE ™
LIFE DISCOVERED. LIFE DIAGNOSED.

www.MeridianBioscience.com/LifeScience

Meridian Life Science

Expertise in Infectious Disease

meridian BIOSCIENCE ™
LIFE DISCOVERED. LIFE DIAGNOSED.

For over 40 years, Meridian Life Science, Inc. has provided antibodies and antigens for research and commercial assay development. With a specialty in infectious disease, the company offers over 1,250 different antibodies and antigens to infectious disease markers and toxins.

Infectious diseases are a leading cause of death, accounting for 30% of the estimated 68 million deaths per year worldwide. They are caused by pathologic agents including bacteria, viruses, fungi and parasites. Many infectious diseases are preventable and controllable if they are accurately diagnosed and treated in a timely manner.

Pregnant woman and children are at a greater risk of acquiring infectious diseases because their immune systems are not fully functioning. Pregnancy weakens the immune system, leaving expectant mothers and their fetuses more vulnerable to contracting a disease. Furthermore, babies do not start producing antibodies until they are 6 months old and a child's immune system is not fully mature until the age of 14. In addition, children, especially under the age of 5, tend to have poor personal hygiene, increasing the spread of infectious agents. Vaccinations have helped prevent and eradicate some of the most contagious diseases, however there are a number of diseases for which researchers are still developing vaccines and many people choose to remain unvaccinated. Preventable infectious diseases still account for two thirds of child deaths worldwide.

The ability to quickly diagnose the cause of an infectious disease has had a large and favorable impact on the care of pregnant women and children. Diagnostic assays that directly identify an infectious agent have become increasingly essential and new diagnostic platforms have increased the potential to detect a wider range of established and newly discovered viruses with greater sensitivity.

KEY PRODUCTS FOR INFECTIOUS DISEASE

ToRCH
- Toxo
- Rubella
- CMV
- HSV-1, 2

RESPIRATORY
- RSV
- Influenza A,B
- Parainfluenza
- *Mycoplasma pneumoniae*
- *Chlamydia pneumoniae*
- *Legionella pneumophila*
- *Mycobacterium tuberculosis*
- *Streptococcus*
- *Staphylococcus*
- SARS Coronavirus
- Adenovirus

CHILDHOOD
- Mumps
- Rubeola
- EBV
- Coxsackie
- Rotavirus
- RSV
- Parvo B 19
- VZV

STDs
- HAV
- HBV
- HCV
- HSV-1, 2
- HIV-1, 2
- HPV
- *Chlamydia*
- *Neisseria*
- Syphilis

TROPICAL
- Nipah
- Dengue 1, 2, 3, 4
- Chikungunya
- Malaria
- Chagas
- Leishmaniasis
- Leptospirosis
- Japanese Encephalitis Virus
- Newcastle disease
- Yellow Fever
- Zika
- Lyme disease
- Ebola

GASTROINTESTINAL
- Norovirus
- Astrovirus
- Adenovirus
- Rotavirus
- *Clostridium difficile*
- *Cryptosporidium*
- *Campylobacter*
- *E. coli*
- *Salmonella*
- *Giardia lamblia*
- *H. pylori*

FOOD & WATER
- Hepatitis A
- *Campylobacter jejuni*
- *E. coli*
- *Legionella*
- *Salmonella*
- *Shigella*
- *Bacillus anthracis*
- *Clostridium*
- *Listeria*
- *Streptococcus*
- *Staphylococcus*
- *Giardia*
- *Cryptosporidium*

Catalog Guide

Company Overview

meridian BIOSCIENCE ™
LIFE DISCOVERED. LIFE DIAGNOSED.

Meridian Life Science, Inc. is a leading large scale manufacturer of:

- Antibodies
- Viral antigens
- Recombinant proteins
- PCR enzymes
- Nucleotides
- Critical assay reagents

Meridian has been providing innovative life science solutions and building trusted partnerships for over 40 years. Meridian's focus is to offer products and services that help to advance the development of diagnostic assays and vaccine development.

- Commercial scale manufacturing of antigens and antibodies with protein purification expertise
- Full line of immunoassay reagents, including antigens, antibodies and blockers
- Large scale production of reagents for molecular assays
- Technical support with assay development experience
- Dedicated R&D and manufacturing teams
- Robust and mature Quality System

ISO certified

Extensive Capabilities and Services

Immunodiagnostics

- Antigens & Antibodies
- Recombinant Proteins
- Blocking reagents

Molecular Diagnostics

- Nucleotides
- enzymes
- qPCR/PCR reagents
- NGS reagents

Contract Services

- Antigens & Antibodies
- Cell & Viral Banking
- PCR/qPCR Assay Development

Global Presence

MERIDIAN BIOSCIENCE, INC.
Parent Company | Founded in 1977 | Nasdaq: VIVO
Headquartered in Cincinnati, OH | 650+ Employees | Presence in 70+ Countries.

America

MEMPHIS, TN
Manufacturing & Sales
Viral Antigens
Recombinant Proteins
In Vitro Antibodies
HAMA Blocking Reagents

BILLERICA, MA
Manufacturing & Sales
LeadCare Diagnostic Product Line

BOCA RATON, FL
Manufacturing
Ascites Production
(in BALB/c or CAF1)

BOSTON, MA
Sales & Distribution

Europe

LONDON, UK
PCR Manufacturing & Sales
PCR /qPCR Molecular Reagents

LUCKENWALDE, GERMANY
Manufacturing
Large Scale Nucleotides
PCR enzymes

PARIS, FRANCE
EU Diagnostics Sales

WATERLOO, BELGIUM
EU Diagnostics Sales

MILAN, ITALY
EU Diagnostics Sales

Asia Pacific

SYDNEY, AUSTRALIA
Sales & Distribution
PCR R&D

SINGAPORE
Sales & Distribution

BEIJING, CHINA
Sales & Distribution
Wholly Owned
Subsidiary Office

ToRCH

ToRCH is an acronym for a group of infections that can cause significant birth defects and fetal death. Meridian Life Science offers a range of reagents which are suitable for multiple assay formats, including IgM and IgG antibody detection, rapid anti-IgM assays, and Immunofluorescence assays (IFA).

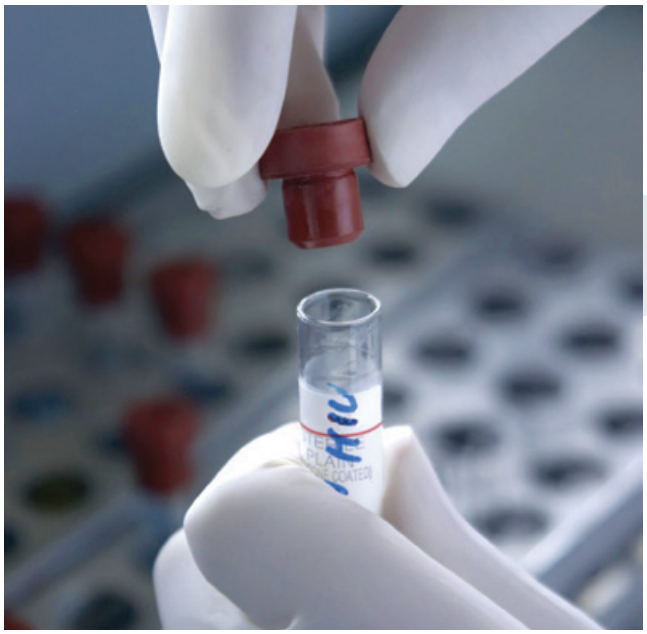
A ToRCH test measures antibodies against five groups of chronic infections:

- Toxoplasmosis
- Rubella
- Cytomegalovirus (CMV)
- Herpes simplex virus (HSV-1/2)
- Other infections (usually syphilis, hepatitis B, coxsackie virus, Epstein-Barr virus, varicella-zoster virus, and human parvovirus)

These infectious diseases are all associated with congenital abnormalities resulting from maternal infection. Although the organisms typically cause only asymptomatic or mild infection to the mother, they can have much more serious consequences to the fetus. If the infection occurs during the first three months of pregnancy and if it is a primary infection (newly acquired during pregnancy), the risk of congenital abnormalities is much higher compared to a secondary or reactivated infection. CMV, which is the most common cause of congenital infectious disease, also has a much higher rate of transmission from mothers with a primary infection (10%) compared to a reactivation (1%). An important part of prenatal care is to recognize these infections in the mother and the fetus and provide suitable care.

> “Although these organisms typically cause only asymptomatic or mild infection in the mother, they can have serious consequences to the fetus.”

For most ToRCH organisms, the initial screening test is based on the detection of antibodies to the organism. Subsequent screening, if required, is carried out using a monoclonal antibody-based immunofluorescent assay (IFA). Assays are commercially available for the detection of IgG, IgM, or both IgG and IgM antibodies. In most cases, IgG reactivity in the absence of IgM reactivity is indicative of a past infection, while IgM reactivity in the absence of IgG reactivity indicates a current infection. However, for some ToRCH diseases such as toxoplasmosis and CMV, IgG avidity has recently been found to be useful for identifying primary infections. An IgG antibody produced in the first few months following an initial infection has a lower avidity than an IgG antibody produced several months or years later. Consequently, low-avidity antibody can be used to specifically identify high-risk mothers with a primary infection. To protect a fetus from ToRCH infection, early diagnosis through first trimester screening is critical.



TORCH IGG & IGM ANTIBODY SCREENING ASSAYS

A ToRCH serologic test must detect both IgM and IgG antibodies to the ToRCH panel of infectious diseases (Toxo, Rubella, CMV and HSV). IgM is the immediate antibody that is produced once a human is exposed to a bacteria, virus or a toxin and disappears within 2 to 3 weeks. It is then replaced by IgG which lasts for life and provides lasting immunity. All of Meridian's ToRCH antigens are suitable for commercial IgG and/or IgM detection. They can be used in a range of immunoassay formats including, but not limited to, ELISA, LF, CLIA, rapid assays, and bead-based assays.

TORCH RAPID IGM CAPTURE ASSAYS

Rapid IgM capture assays are particularly sensitive in detecting IgM responses early in illness. The assay works by binding IgM antibodies in the patient's specimen to a solid phase coated with an anti-IgM capture antibody. Soluble antigen is added in excess allowing the IgM antibody-antigen reaction to occur in the absence of competing IgG. Finally, a labelled detection antibody is added that has specific reactivity against the antigen. Assay sensitivity can be highly dependent on the purity of the antigen used.

TORCH IMMUNOFLUORESCENT ANTIBODY ASSAYS (IFA)

IFA is a traditional laboratory technique that utilizes fluorescent dyes to identify the presence of antibodies bound to specific antigens. Definitive diagnosis of a ToRCH infection, in particular HSV-1 or HSV-2, sometimes requires confirmation by IFA after a positive EIA result.

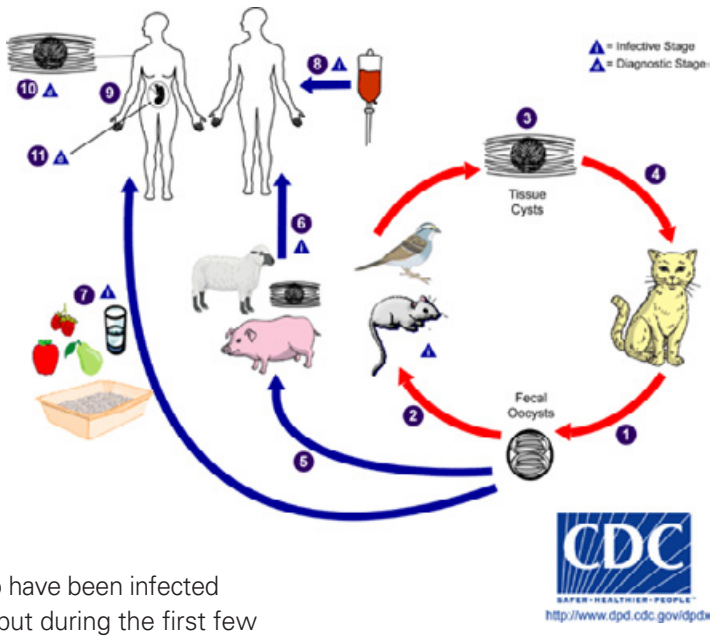
Toxoplasma

Toxoplasmosis is caused by the protozoan parasite *Toxoplasma gondii.* It can infect most species of warm blooded animals, including humans, and can cause toxoplasmosis disease.

The only known definitive hosts for *Toxoplasma gondii* are members of family Felidae (domestic cats and their relatives). Unsporulated oocysts are shed in the cat's feces and these take 1-5 days to sporulate in the environment and become infectious. Intermediate hosts in nature (including birds and rodents) become infected after ingesting soil, water or plant material contaminated with oocysts. Cats become infected after consuming intermediate hosts harboring tissue cysts. Humans can become infected by any of the following routes:

- Eating undercooked meat of animals harboring tissue cysts
- Consuming food or water contaminated with cat feces or by contaminated environmental samples (such as fecal-contaminated soil or changing the litter box of a pet cat)
- Blood transfusion or organ transplantation
- Transplacentally from mother to fetus

LIFE CYCLE OF T.GONDII



Up to a third of the world's human population is estimated to have been infected with *toxoplasma gondii.* Infection is usually asymptomatic, but during the first few weeks after exposure the infection may cause a mild, flu-like illness. However, in those with weakened immune systems, such as those with AIDS and pregnant women, it can cause a serious and sometimes fatal illness.

CONGENITAL TOXOPLASMOSIS

Congenital toxoplasmosis is a group of symptoms that occur when a fetus is infected with *T. gondii.* If a mother becomes infected while pregnant, the parasite can spread to a developing fetus across the placenta. The risk of congenital disease is lowest (10 – 25%) when maternal infection occurs during the first trimester and highest (60 – 90%) when maternal infection occurs during the third trimester. Congenital disease is most severe when infection is acquired in the first trimester. The overall risk of congenital infection from acute *T. gondii* infection during pregnancy ranges from approximately 20 – 50%.

DIAGNOSIS

Diagnosis is usually made by detection of Toxo-specific IgG and IgM antibodies. A test that only measures IgG is used to determine if a person has previously been infected. When it is necessary to try to estimate the time of infection, such as in pregnancy, an IgM test is also used along with other tests such as an IgG avidity test.

Diagnosis can also be made by direct observation of the parasite in stained tissue sections, cerebrospinal fluid (CSF), or other biopsy material.

REAGENTS FOR SEROLOGIC TESTING

8158 | ***T. gondii* Native Antigen, Concentrated**
- Purified whole tachyzoite preparation, RH strain
- Propagated in Vero cells
- High protein concentration (~1mg/ml)
- Buffer: PBS, pH 7.4 containing 1% Triton x-100

8200 | ***T. gondii* Native Antigen**
- Purified whole tachyzoite preparation, RH strain
- Propagated in Vero cells
- Protein concentration: ~0.5 mg/mL by BCA Assay
- Buffer: PBS, pH 7.4 containing 1% Triton x-100

IgG & IgM Detection for ELISA and WB Assays

8159 | ***T. gondii* Native Antigen, IgM**
- Purified membrane fraction (highly specific for Toxoplasma p30), RH strain
- Protein concentration ~ 0.5 mg/mL (BCA Assay)
- Buffer: Phosphate Buffered Saline, pH 7.4 containing 2% N-octyl-β-D-Glucopyranoside (OGP).

IgM Detection for ELISA and WB Assays

R01573 | ***T. gondii* p30 (SAG1) Recombinant Antigen**
- Recombinant protein *(E. coli)*, ≥ 95% pure (SDS-PAGE)
- Contains a His-tag at the N-terminus
- Calculated molecular weight 36.6kDa
- Protein concentration: ~0.8mg/ml
- Buffer: 20 mM Phosphate Buffer, pH 8.0, 1 M Sodium Chloride, 0.1% Polyoxyethylene (10) Tridecyl Ether

IgG Detection for EIA Assays

R01581 | ***T. gondii* p35 (GRA8) Recombinant Antigen**
- Recombinant protein *(E. coli)*, ≥ 95% pure (SDS-PAGE)
- Contains a His-tag at the N-terminus
- Calculated molecular weight 21.7kDa
- Protein concentration: ~1.0mg/ml
- Buffer: 20 mM Phosphate Buffer, pH 8.5, 150 mM Sodium Chloride

IgG & IgM Detection for EIA Assays

C86319M | **MAb to *T. gondii***
- Reacts with p30 membrane protein

C01589M | **MAb to *T. gondii*, 38kDa protein**
- Recognizes a 38 kDa protein

C01523M | **MAb to *T. gondii* SAG1 (p30) protein**
- Specific for the SAG1 protein

IFA Detection

Rubella

Rubella, also known as German Measles, is a viral illness caused by a togavirus of the genus *Rubivirus* and is an infection that primarily affects the skin and lymph nodes. It is generally a mild disease in adults and children, but it can have devastating effects on infants.

The primary medical danger of rubella is the infection of pregnant women, because it can cause congenital rubella syndrome (CRS) in developing fetus. Since the introduction of the measles-mumps-rubella (MMR) vaccine, rubella is much less common, however, several countries still do not include this vaccine in their immunization schedule. In the absence of vaccination, rubella is an endemic disease with epidemics every 6 to 9 years.

Rubella is spread by coughing and sneezing. The virus resides in the nose and throat of an infected person with an average incubation period of 14-21 days. A person infected with rubella may spread the disease to others beginning one week before the rash occurs. Symptoms generally occur 2-3 weeks after exposure to the virus and includes a mild fever, headache and runny nose.

COUNTRIES USING RUBELLA VACCINE IN NATIONAL IMMUNIZATION SCHEDULE, 2012

Source: WHO/UNICEF coverage estimates 2012 revision, July 2013. 194 WHO Member States. Map production: Immunization Vaccines and Biologicals, (IVB). World Health Organization Date of slide: 24 July 2013.

CONGENITAL RUBELLA SYNDROME (CRS)

A rubella infection just before conception (0-28 days) or during the first trimester in pregnancy has the highest rate of transmission to the fetus (90%) resulting in congenital rubella syndrome (CRS). At 14 weeks, this incidence is reduced to 52%, and by the end of the second trimester, the incidence drops to 25%. Fetal rubella infection often results in spontaneous abortion or severe fetal defects, including heart, brain, ear or eye malformations, deafness, microcephaly, and mental retardation. Before the introduction of the vaccine, up to 4 babies in every 1000 live births were born with CRS.

DIAGNOSIS

Rubella virus can be detected from nasal, throat, urine, and blood specimens from infected individuals. Diagnosis is usually made by the detection of Rubella-specific IgM antibodies which are usually present 4–30 days after the onset of illness. However, reliable serodiagnosis requires the discrimination of specific IgM primary rubella from persistent, reactivated or non-specific IgM reactivity. Recent infection can be confirmed or excluded by additional assays such as Rubella IgG avidity and immunoblot analysis.

REAGENTS FOR SEROLOGIC TESTING

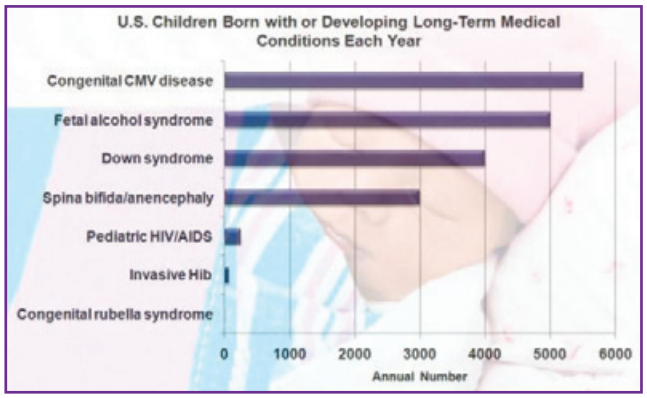
6075	**Rubella Native Antigen, Grade III** • Strain HPV77, propagated in Vero cells • Purified antigen • Protein concentration: 0.1-0.2mg/mL by OD 260/280nm • Buffer: 10mM Tris, 150mM NaCl, 1mM EDTA, pH 8.0-8.4	IgG Detection for ELISA & CLIA Assays
6076	**Rubella Native Antigen, Grade IV** • Strain HPV77, propagated in Vero cells • Highly purified antigen • Protein concentration: 0.5mg/mL by OD 260/280nm • Buffer: 10mM Tris, 150mM NaCl, 1nM EDTA, pH 8.0-8.4	IgG & IgM Detection for ELISA, CLIA and Bead-based Assays
6123	**Rubella Native Antigen, Grade IV (PBS)** • Strain HPV77, propagated in Vero cells • Highly purified antigen • Buffer: Sucrose/PBS, pH 7.4-7.7	
6200	**Rubella Native Antigen, RSVP™ (Capsid Free)** • Strain HPV77, propagated in Vero cells • Purified using a proprietary process • Contains the envelope spike protein comprised of E1 and E2 in their native configuration • Buffer: 0.1M Na_2CO_3, 0.1M NaCl, pH 7.9-8.3	Very sensitive IgM Detection for ELISA and Bead-based Assays
EV9525	**MAb to Rubella E1 Protein** • Specific for the E1 protein	Paired Ab/Ag for IgM Capture Assays
EV9526	**MAb to Rubella E1 Protein** • Specific for E1 protein and reacts with non-reduced antigens on Western Blot • Exhibits low level of HI activity • Exhibits neutralizing activity	
6076	**Rubella Native Antigen, Grade IV**	

CMV

The CMV diagnostics market is growing due to an increased prevalence of CMV infections worldwide and better disease awareness. In the U.S., 60% of the population is carrying CMV and more than 90% of those are in a high risk category (AIDS patients and prenatal babies of CMV infected mothers).

Human cytomegalovirus (CMV, also called Human herpesvirus 5) is a member of the herpes virus family and shares the characteristic ability to remain latent within the body for life within an infected individual. Although a CMV infection is typically asymptomatic in healthy persons, immunocompromised individuals such as AIDS patients, organ transplant recipients and newborn infants, are at high-risk of developing life-threatening complications from primary infections and reactivations.

CMV is not considered highly contagious and the virus is generally passed through direct contact with body fluids, such as urine, saliva, breast milk, transplanted organs and blood transfusions. Healthy pregnant women are not at special risk for disease from CMV infection but between 5-8% are infected for the first time during their pregnancy, and this can lead to serious complications. Among infants born with CMV infection (congenital CMV), about 20% will have permanent disabilities. There is no vaccine available to protect against CMV and public health measures focus on reducing the risk of CMV transmission to pregnant women, women of childbearing age and other people at risk of more serious infections.



Source: cdc.gov

CONGENITAL CMV

Congenital Cytomegalovirus (CMV) refers to a group of symptoms that occur when an infant is infected before birth and it is the most common cause of congenital viral infections worldwide. Only 10% of congenitally infected newborns display abnormalities at birth, however 80% - 90% will develop complications within the first few years of life. Symptoms of congenital CMV include hearing loss, vision impairment, and varying degrees of mental retardation. The risks for a fetus becoming infected by CMV appear to be almost exclusively associated with women who are having a primary infection during pregnancy. There appears to be little risk of CMV related complications for women who have been infected at least 6 months prior to conception.

DIAGNOSIS

Various diagnostic tests have been developed to detect a CMV infection including viral culture, serological assays, PCR analysis and cytopathology. The pp65 antigenemia test, in which a monoclonal antibody against CMV pp65 is used to detect a major CMV matrix protein (pp65) in leukoctyes, has the longest history in clinical use. However, it has been criticized for its subjectivity in reading positive results, time consuming and intricate procedures, difficulty in standardization, and a need for sufficient leukocytes. The ELISA IgG/IgM assay which measures antibodies to CMV, specifically CMV IgM, IgG and IgG avidity, has become the most commonly available serologic test. The detection of IgM is indicative of an acute or primary infection whereas the detection of IgG is indicative of a past infection. In the case where both IgM and IgG can be detected, the level of IgG avidity can help distinguish between an acute infection and a past infection. For this reason, newer assays have begun to incorporate the detection of anti-CMV IgM together with determination of the avidity index of anti-CMV IgG.

To improve the sensitivity and specificity of CMV antibody detection, immunogenic CMV proteins have been studied and characterized during the past two decades and over 15 structural polypeptides have been identified in a natural infection. The combination of antigens selected is the most critical element affecting assay sensitivity and specificity.

The most suitable proteins are reportedly:

- CMV pp150: a tegument phosphoprotein detectable during both latent and re-activated infections. During primary infection the antibody response to pp150 may be delayed.
- CMV pp52: the major DNA binding protein, nonstructural nuclear phosphoprotein which is regarded as an early marker of seroconversion
- CMV pp65: major structural phosphoprotein (lower matrix) and main component of extracellular virus particles. The antibody response is detectable during early infection only
- CMV gB Antigen: a membrane glycoprotein which is the most abundant component of the viral envelope and a target of neutralizing antibodies
- CMV pp38: structural protein suggested to be an important immunodominant protein in early infection

Evidence also suggests that CMV-IgM detection against viral structural proteins (pp150 and pp38) are a valuable parameter for the early diagnosis of a recurrent CMV infection. Several diagnostic manufacturers have incorporated a combination of CMV lysate and CMV recombinant proteins to improve assay performance.

REAGENTS FOR SEROLOGIC TESTING

7504 | **CMV-G Native Antigen**
- Whole cell extract, >10% viral protein
- Strain AD169 propagated in human fibroblast cells
- 0.25 mg/mL by OD 260/280nm
- Buffer: 0.1M Glycine, pH 9.3-9.7

7517 | **CMV Ext-2 Native Antigen (Concentrate)**
- Enriched for cell surface glycoprotein antigens, >10% viral protein
- Strain AD169 propagated in human fibroblast cells
- Protein concentration: 0.2-1mg mg/mL by OD 260/280nm
- Buffer: 0.1M Glycine, pH 9.5±0.2

7600 | **CMV Native Antigen**
- Viral lysate prepared by centrifugation to remove cell debris
- Strain AD169 propagated in MRC-5 cells
- Buffer: Glycine buffered saline, pH 9.5

EV7509 | **CMV gB Native Antigen**
- Strain AD169 propagated in human fibroblast cells
- Buffer: 0.1M Glycine, pH 9.5 ± 0.2 5

R18102 | **CMV gB Recombinant Antigen**
- Contains the CMV gB immunodominant region (Strain C194) and a GST fusion partner
- Immunoreactive with CMV positive sera
- Produced in *E. coli*, >95% pure (SDS-PAGE)
- Buffer: 25mM Tris-HCl, 1mM EDTA, pH 7.2 and 50% glycerol

R01686 | **CMV Chimeric Recombinant Antigen**
- Produced in *E. coli*, >95% pure (SDS-PAGE)
- 31.6kDa calculated MW
- Buffer: 20 mM NaP @ pH8, 1 M NaCl

IgG Detection for EIA Assays

7511 | **CMV IgM Native Antigen (Concentrate)**
- Preparation of nuclear extract and ER antigens
- Strain AD169 propagated in human fibroblast cells
- Buffer: 0.1M Glycine, pH 9.3-9.7

IgM Detection for EIA Assays

CMV *continued*

REAGENTS FOR SEROLOGIC TESTING (cont)

EV9268 | **CMV II Native Antigen**
- Purified surface extract containing pp65, pp52, pp150 and other key proteins
- Strain AD169 propagated in human fibroblast cells
- Buffer: 0.1M Glycine, pH 9.5±0.2

7507 | **CMV III Native Antigen**
- Purified surface extract enriched for pp65, >60% viral protein
- Strain AD169 propagated in human fibroblast cells
- Protein concentration: 0.8-1.2mg/mL by BCA
- Buffer: 0.1M Glycine, pH 9.3-9.7

7600 | **CMV Native Antigen**
- Viral lysate prepared by centrifugation to remove cell debris
- Strain AD169 propagated in MRC-5 cells
- Buffer: Glycine buffered saline, pH 9.5

IgG & IgM Detection for EIA Assays

CMV pp52 (UL44) Recombinant Antigens

R01565 |
- Represents residues 202-434 of CMV pp52, fused with a GST tag at the N-terminus
- Molecular weight of 51kDa
- Produced in *E. coli*, ≥ 90% pure (SDS-PAGE)
- Buffer: 50mM Tris-HCl, 60mM NaCl, 10mM GSH, 0.25% Sarcosyl, 50% Glycerol, pH 8.0

R01561 |
- Represents a truncated portion of CMV pp52 gene fused to a His-tag at the N-terminus
- Produced in *E. coli*, ≥ 95% pure (SDS-PAGE)
- Buffer: 20mM Sodium Phosphate, 1M NaCl, pH 8.0

R18062 |
- Represents a truncated portion of CMV pp52 gene fused to a GST-tag
- Molecular weight of 44kDa
- Produced in *E. coli*, ≥ 95% pure (PAGE)
- Buffer: 50mM Tris-HCl, pH 7.2 containing 60mM NaCl, 10mM GSH, 50% Glycerol

R01562 |
- Represents CMV pp65 gene fused to a His-tag at the N-terminus
- Molecular weight of 35kDa
- Produced in *E. coli*, ≥ 95% pure (SDS-PAGE)
- Buffer: 20mM Sodium Phosphate, 1M NaCl, 0.1% Polyoxyethylene (10) Tridecyl Ether and 8M Urea, pH 8.0

R18412 |
- Represents CMV pp65 (strain AD169) gene fused to a GST-tag
- Molecular weight of 50kDa
- Produced in *E. coli*, ≥ 95% pure (SDS-PAGE)
- Buffer: 25mM Tris-HCl, 1mM EDTA, pH 7.2 containing 50% Glycerol

IgM Detection for EIA Assays

CMV pp38 (UL80a) Recombinant Antigen

R18512
- Represents the immunodominant regions of the CMV pp38 gene
- Molecular weight of 55kDa
- Produced in *E. coli*, ≥ 95% pure (PAGE)
- Buffer: 25mM Tris-HCl, 1mM EDTA, pH 7.2 containing 50% Glycerol

IgM Detection for EIA Assays

CMV pp150 (UL32) Recombinant Antigen

R01564
- Represents residues 1011-1048 of CMV pp150, fused with a GST tag
- Molecular weight of 35kDa
- Produced in *E. coli*, ≥ 90% pure (PAGE)
- Buffer: 50mM Tris-HCl, 60mM NaCl, 10mM GSH, 0.25% Sarcosyl, 50% Glycerol, pH 8.0

R01563
- Represents a truncated portion of CMV pp150 gene fused to a His-tag at the N-terminus
- Molecular weight of 16kDa
- Produced in *E. coli*, ≥ 95% pure (PAGE)
- Buffer: 20mM sodum phospaste, 1M NaCl, 0.1% Polyoxyethylene (10) Tridecyl Ether, pH 7.5.

R18113
- Contains the CMV pp150 immunodominant region and a GST tag
- Molecular weight of 32kDa
- Produced in *E. coli*, ≥ 90% pure (PAGE)
- Buffer: 25 mM Tris-HCl, pH 8.0, 1 mM EDTA containing 50% Glycerol

IgG & IgM Detection for EIA Assays

C86314M | **MAb to CMV Early Antigen**
- Reacts with 65kDa protein of CMV

EV9268 | **CMV II Native Antigen**

Paired Ab/Ag for IgM Capture Assays

C8A022M | **MAb to CMV Immediate Early Antigen (IEA)**
- Specific for CMV IEA pp72

IFA Detection

HSV-1 & HSV-2

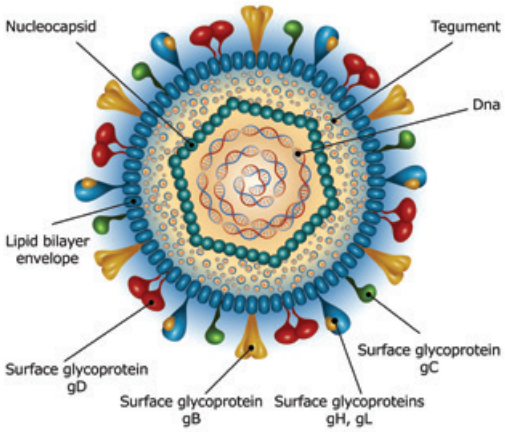
Herpes simplex virus (HSV) types 1 and 2 are common infections worldwide. However, the majority of infected individuals remain undiagnosed because they are asymptomatic.

HSV-1 is usually transmitted during childhood through contact with oral secretions (cold sores). Seroprevalence studies indicate about 60% of adults in the United States are infected with this virus. HSV-2 is usually spread by sexual contact (genital herpes). Consequently this infection usually occurs later in life and the seroprevalence rates vary dramatically by geographic region.

Both HSV-1 and HSV-2 establish a lifelong, latent infection in the nervous system and there is no cure. Antiviral medications can reduce the frequency, duration and severity of outbreaks and over a period of several years, many infected individuals experience less severe symptoms and fewer outbreaks, although they are still contagious to others.

The greatest risk of an HSV infection is in neonates and infants, when an infected mother passes it to her fetus in utero or during delivery. A neonatal HSV infection can be devastating to an infant and 70 - 85% of these infections are caused by HSV-2. Many infants infected with HSV are born prematurely and approximately 4% can develop congenital HSV which has serious consequences including death.

HERPES SIMPLEX VIRUS



CONGENITAL HERPES SIMPLEX

In most cases, babies contract congenital herpes in the birth canal during delivery (especially if the mother has an active outbreak of genital herpes at the time of delivery). In rare circumstances, it is possible to be infected in the uterus or immediately after birth (from being kissed or having other contact with someone who has herpes mouth sores). Congenital HSV is a serious condition and affects about 1 out of every 3,000-20,000 live births. Detection and prevention is difficult because the infected mother is typically asymptomatic. Congenital herpes symptoms usually appear within the first month of the infant's life and antiviral treatments such as vidarabine and acyclovir have proven helpful to reduce the severity of the disease. However, infants with systemic herpes or encephalitis often do poorly, despite antiviral medications and early treatment.

DIAGNOSIS

Mother and baby are usually tested simultaneously if herpes is suspected. Diagnostic methods include serological tests such as ELISA and IFA, as well as PCR blood tests and cell culture. Due to a high degree of genetic similarity between HSV-1 and HSV-2, most viral proteins induce a cross-reactive antibody response that hampers the discrimination between HSV-1 and HSV-2 infections using serological approaches. Since the discovery of the serologically distinct HSV viral envelope glycoproteins gG-1 (HSV-1) and gG-2 (HSV-2), new type-specific immunoassays have been developed that are capable of discriminating between HSV-1 and HSV-2 infections. Since antibodies may take several weeks to reach detectable levels after primary infection, negative results should be confirmed by repeat testing 4 to 6 weeks after a suspected early infection.

REAGENTS FOR SEROLOGIC TESTING

7305	**HSV-1 Native Antigen**	IgG Detection for ELISA and CLIA Assays
7309	**HSV-1 Native Antigen (Concentrate)** • Strain F produced in Vero cells • >10% viral protein • Buffer: 0.1M Glycine, pH 9.5 ± 0.2	
7705	**HSV-2 Native Antigen**	
7749	**HSV-2 Native Antigen (Concentrate)** • Strain G produced in Vero cells • >10% viral protein • Buffer: 0.1M Glycine, pH 9.5 ± 0.2	
VTI520	**HSV-1 Recombinant Antigen, Glycoprotein G 1** • Represents amino terminal Met1-Asp190 and fused with superoxide dismutase 1 (SOD) • Produced in *Saccharomyces cerevisiae* • Buffer: 0.05M Malonate with 6.0M Urea, pH 5.2 ± 0.2	IgM Detection & Type specific for ELISA and CLIA Assays
VTI530	**HSV-2 Recombinant Antigen, Glycoprotein G 2** • Represents unique sequences not present in HSV-1 • Fused with superoxide dismutase 1 (SOD) • Produced in *Saccharomyces cerevisiae* • Buffer: 50mM NaH_2PO_4, 160mM KCl, 5mM DTT, pH 7.0 ± 0.1	
R01594	**HSV-2 Antigen Glycoprotein G (gG)** • Made synthetically > 99% pure (Analytical HPLC and Mass Spectrometry) • Contains the HSV-2 gG immunodominant regions • Immunoreactive with HSV positive sera • Buffer: 25 mM Tris-HCl, pH 8	IgM Detection & Type Specific for ELISA
R01673	**HSV-2 Recombinant Antigen Glycoprotein G (gG)** • Contains the gG-2 prepared by expressing the gene US4 from HSV-2 • Molecular Weight (Calculated): 35.8 kDa • Produced in *E. coli*, ~95% pure (12.5% SDS-PAGE) • Buffer: 20 mM PBS @ pH 7, 1 M NaCl	IgM Detection & Type Specific for ELISA, CLIA & LF Assays
C05014MA	**MAb to HSV-1 Nucleocapsid protein (155kDa)** • Reacts with HSV-1 Glycoprotein G 1 • Cross-reacts with HSV-2 nuclear protein	IFA Detection
C66150M	**MAb to HSV-1 Glycoprotein G 1** • Reacts with HSV-1 Glycoprotein G 1	
C01859M	**MAb to HSV-2 Glycoprotein D (gD)** • Reacts with HSV-2 Glycoprotein gD	ELISA & IFA Detection Assays

Varicella Zoster Virus (VZV)

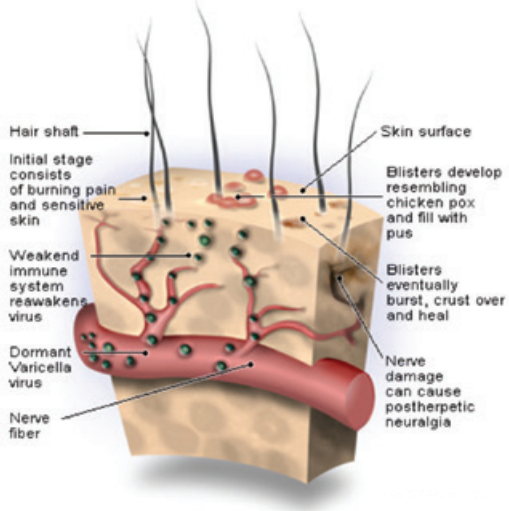
VZV is one of eight herpes viruses and commonly causes chickenpox in children, teens and young adults and herpes zoster (shingles) in adults. It is usually a mild disease that lasts a short time in healthy children. However, it can be severe in adults and may cause serious and even fatal complications in people of any age.

VZV infects the nerves causing a wide variety of symptoms and two clinically distinct forms of disease. Primary infection results in chickenpox and recurrent infections leads to herpes zoster (shingles). Symptoms of VZV are exhibited between 10 and 21 days after infection. The main symptom is a rash that turns into open lesions which crust over. It is spread through the airborne route primarily from the skin vesicles. The immunologic mechanism that controls latency of VZV is not well understood, however factors associated with recurrent disease include aging, immunosuppression, intrauterine exposure to VZV, and having had varicella at a young age (younger than 18 months).

Infection with VZV is generally mild and self-limited, but it may be associated with complications, especially in adults or children under 1-year old. Secondary bacterial infections of skin lesions with *Staphylococcus* or *Streptococcus* are the most common cause (5% of cases) of hospitalization and invasive group A streptococci can lead to serious illness or death. Other complications include secondary pneumonia (bacterial or viral), aseptic meningitis, encephalitis, myocarditis and arthritis. A more rare complication is Reye's syndrome and occurs almost exclusively in children who take aspirin during the acute illness.

Routine vaccination against VZV is performed in the United States and Japan, however most countries still do not vaccinate. It is now available as a quadrivalent measles-mumps-rubella-varicella (MMRV) vaccine and it is gaining wider acceptance globally. The VZV vaccine is on the World Health Organization's (WHO) List of Essential Medicines, a list of the most important medications needed in a basic health system.

VARICELLA VIRUS



Source: MedicineNet, Inc.

CONGENITAL VZV INFECTION

Primary maternal varicella infection in the first 20 weeks of gestation is associated with a variety of abnormalities in the newborn collectively known as congenital varicella syndrome. The range and severity of associated symptoms and physical findings may vary greatly from case to case depending upon when the maternal varicella zoster infection occurred during fetal development. In general, newborns with congential VZV have a low birth weight, distinctive skin abnormalities, and brain malformations.

DIAGNOSIS

The clinical presentations of VZV are very characteristic, however diagnosis is important for determining the immune status before prognostic and therapeutic monitoring. Several methods exist including polymerase chain reaction (PCR), direct immunofluorescent assay (DFA), viral isolation and serologic assays that detect VZV-specific antibodies. Recent infection is suggested by the detection of serum VZV-specific IgM antibodies, but this can be less reliable for herpes zoster where specific antibodies are already present. The National VZV Laboratory at the CDC has developed a reliable IgM capture assay. Other current commercials assays for determining VZV immune status include ELISAs, latex agglutination, indirect-immunofluorescence assay (IFA) and enzyme-linked fluorescent immunoassay (ELFAs).

REAGENTS FOR SEROLOGIC TESTING

7209 | **VZV Native Antigen**
- Prepared from infected (Ellen strain) HF cells
- Partially purified >10% viral protein
- Buffer: 0.1M Glycine, pH 9.3-9.7

7201 | **VZV Native Antigen (PBS buffer)**
- Prepared from infected (Ellen strain) HF cells
- Partially purified >10% viral protein
- Buffer: PBS, pH 7.3-7.7

7740 | **VZV Grade II Native Antigen (detergent free)**
- Prepared from infected (Ellen strain) HF cells
- Protein concentration: 0.2-1.0mg/mL by OD260/280
- Buffer: 0.1M Glycine, pH 9.3-9.7

IgG Detection for EIA Assays

C05100MA | **MAb to VZV**
- Rotavirus group A specific antigen VP6
- Reacts with strains EDIM, SA-11, WA, and bovine NCDV strains

7209 | **VZV Native Antigen**

Paired Ag/Ab for IgM Capture Assays

C05101MA | **MAb to VZV (gpI & IV)**
- Reacts with precursor as well as with mature VZV glycoprotein I and glycoprotein IV

C05102MA | **MAb to VZV (gpII)**
- Reacts with the carboxy region of VZV glycoprotein II (VZVgB)

C05104MA | **MAb to VZV (gpIII)**
- Reacts with VZV glycoprotein III

C05105MA | **MAb to VZV (gpIV)**
- Reacts with VZV glycoprotein IV (VZVgI) and to a lesser extent VZV glycoprotein I (VZVgE) by immunoprecipitation test
- Reacts with both precursor and mature glycoprotein IV (VZVgI)

C05107MA | **MAb to VZV (175 kDa, Gene 62)**
- Reacts with VZV immediate early protein encoded by gene 62

C05108MA | **MAb to VZV (Mixed)**
- A mixture of MAbs to VZX - includes CAT# C05100MA, C05101MA, C05102MA, C05104MA, C05105MA and C05107MA

IFA Detection

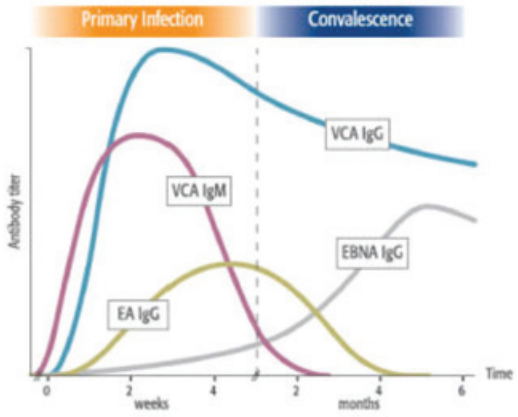
Epstein-Barr Virus (EBV)

The Epstein–Barr virus (EBV), also called human herpesvirus 4 (HHV-4), is a virus of the herpes family and infects more than 95% of the world's population. The most common manifestation of primary infection with this organism is acute infectious mononucleosis, a self-limited disease that frequently affects adolescents and young adults.

Primary EBV infections are typically asymptomatic and it is perhaps the most common reason for fever of unknown origin in young children. It does not occur in epidemics and has relatively low transmissibility, spreading mainly through bodily fluids (saliva). Approximately 90% of the US population is infected with EBV by the age of 25 and this infection rate is similar in other developed countries worldwide. EBV during pregnancy and transplacental transmission is rare. When infection with EBV occurs during adolescence or young adulthood, it causes infectious mononucleosis 35% to 50% of the time.

EBV is the first human virus to be directly implicated in carcinogenesis. Infection is associated with particular forms of cancer, such as Hodgkin's lymphoma, Burkitt's lymphoma, nasopharyngeal carcinoma, and conditions associated with AIDS including hairy leukoplakia and central nervous system lymphomas. In particular in Africa, the virus is associated with endemic Burkitt lymphoma in the setting of co-infection with *Plasmodium falciparum.* Specifically, it has been found that a malaria infection can impair the T-cell response to EBV and directly contribute to tumor pathogenesis.

EBV INFECTION KINETICS



Source: katkars.com

DIAGNOSIS

Diagnosing an EBV infection can be challenging since the symptoms are similar to other illnesses. However, different proteins are expressed during the various stages the EBV life cycle and the detection of these antigens can help distinguish whether an infection is a primary acute, convalescent, latent, or reactivation infection. Diagnostic methods for EBV include IFA, ELISA, blot techniques, IgG avidity, PCR and virus isolation. About 90% of adults have antibodies that show that they have a current or past EBV infection. In most cases, the antibody response occurs rapidly during primary EBV infection.

Tests are available for detecting antibodies to the following EBV-associated antigens:

Viral capsid antigen (VCA)

- Elevated anti-VCA IgM indicates acute infection: appears early in infection and usually disappears within 4 - 6 weeks
- Elevated anti-VCA IgG indicates prior infection: appears in the acute phase, peaks 2-4 weeks after onset, declines slightly, then persists for the rest of a person's life
- Common VCA proteins are gp125 and p19

Early antigen (EA)

- Anti-EA IgG appears in the acute phase of illness and generally falls to undetectable levels after 3-6 months
- In many people, detection of antibody to EA is a sign of an active infection
- 20% of healthy people may have antibodies against EA for several years

EBV nuclear antigen (EBNA)

- Antibody to EBNA is not seen in the acute phase of EBV infection but slowly appears 2-4 months after onset of symptoms
- Persists for the rest of a person's life

REAGENTS FOR SEROLOGIC TESTING

7420 | **EBV Native Antigen**
- Prepared from a detergent extraction of P_3HR-1 or P_3H_3 cells that have been induced by TPA and sodium butyrate
- Partially purified >10% viral protein
- Buffer: Carbonate, pH 9.5±0.2

R01522 | **EBV EBNA-1 Recombinant Antigen (full length)**
- Represents full length EBNA-1 and contains a His-tag at the N-terminus
- Produced in *E. coli*
- Buffer: 6M Urea, 20mM Phosphate, pH 8.0, 1M Sodium Chloride, 0.1% Polyoxyethylene(10)Tridecylether

IgG Detection for ELISA and WB Assays

8202 | **EBV VCA (gp125) Antigen**
- Purified antigen concentrate from P_3H_3 cells
- Concentration: ~ 30 µg/mL (Non-Interfering Protein Assay)
- Buffer: 20 mM Tris-HCl, pH 7.4 containing 3M Magnesium Chloride

R01525 | **EBV p138 (EA-D) Recombinant Antigen**
- Represents the complete ORF of the BALF2 gene (Early Antigen D)
- Contains a His-tag at the N-terminus
- Produced in *E. coli*
- 6M Urea, 20mM Phosphate, pH 8.0, 1M Sodium Chloride, 0.1% Polyoxyethylene(10)Tridecylether

IgM Detection for ELISA, WB, Lateral Flow and CLIA Assays

C66405M | **MAb to EBV (gp125)**
- Reactive against EBV VCA gp125

C65023M | **MAb to EBV (VCA)**
- Recognizes EBV, specific for VCA

C65221M | **MAb to EBV (EBNA-1)**
- Specific for envelope glycoprotein complex 220/350
- EBV glycoprotein gp220/350 is the major glycoprotein associated with the EBV envelope (the 220 kd protein is the result of RNA splicing)

IFA Detection

R01763 | **Enterovirus A Coxsackievirus A16 Recombinan Antigen**
- Produced in *E. coli* (> 85% Purity)
- Buffer: Tris Buffer, pH 8.0, 0.09% Sodium Azide

R01764 | **Enterovirus A EV71 Recombinant Antigen**
- Produced in *E. coli* (> 85% Purity)
- Buffer: Tris Buffer, pH 8.0, 0.09% Sodium Azide

R01765 | **Enterovirus D EV70 Recombinant Antigen**
- Produced in *E. coli* (> 85% Purity)
- Buffer: Tris Buffer, pH 8.0, 0.09% Sodium Azide

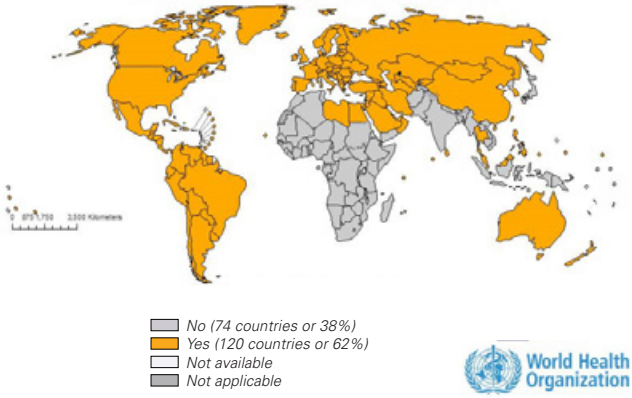
Control in Lateral Flow Assays and Immunogen

Mumps

Mumps is an enveloped single-strand RNA virus of the *Rubulavirus* genus that causes painful swelling of the salivary glands. It is highly contagious and predominantly affects children.

The mumps virus resides in the mucus of the nose and throat of an infected person and it is mainly spread through coughing and sneezing. Symptoms may not appear for 12-25 days after transmission, however an infected person is contagious from 3 days prior to the onset of symptoms to 9 days after. In general, only supportive care is needed to resolve a mumps infection but occasionally it causes serious complications including meningitis, encephalitis, deafness and orchitis (inflammation of the testicles in males). Before the routine vaccination program was introduced in the United States (in 1967) and other countries, mumps was a common illness in infants, children and young adults. However, due to vaccination the disease is becoming rare.

COUNTRIES USING MUMPS VACCINE IN NATIONAL IMMUNIZATION SCHEDULE, 2012



DIAGNOSIS

Standard assays that detect mumps include viral detection methods, RT-PCR and serologic assays in both EIA and IFA formats. Specifically, assays that detect both IgM and IgG antibodies work well for diagnosing mumps infection in immunologically naïve individuals. However, the IgM response and viral shedding that occurs in persons who have been previously vaccinated or naturally infected are moderate in duration and intensity, making detection difficult. Recent research has shown that the enzyme-linked immunospot (ELISPOT) assay could be used as a more reliable diagnostic. This immunoassay method is based on the sandwich ELISA technique and is highly sensitive and the enables detection of activated mumps-specific, antibody-secreting B cells in whole blood.

REAGENTS FOR SEROLOGIC TESTING

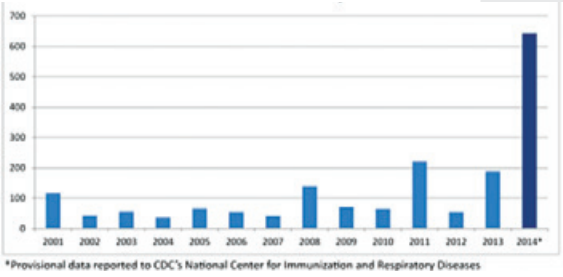
8099	**Mumps Native Antigen** • Prepared from a glycine extraction of infected (Enders Strain) LLC-MK2 cells • >10% viral protein, partially purified to reduce host cell components • Protein concentration: 0.2-1.0mg/mL by OD 260/280nm • Buffer: 0.1M Glycine, pH 9.3–9.7	IgG Detection for EIA Assays
EV9529	**Mumps Grade III Native Antigen** • Prepared from infected (Enders Strain) LLC-MK2 cells • Purified by ion exchange chromatography to remove host cell protein • Buffer: 0.1 Na_2CO_3, 0.1M NaCl, pH 7.9-8.3	IgM Detection for EIA Assays
C01719M **C01720M** **C01721M**	**MAb to Mumps Virus Nucleoprotein** • Reacts with Mumps Virus Nucleoprotein	ELISA & IFA Detection Assays

Rubeola (Measles)

Rubeola (also known as measles) is a highly contagious viral infection of the respiratory system, immune system, and skin. Rubeola is caused by a paramyxovirus of the genus *Morbillivirus*.

Complication with measles is common and can be fatal. It is a leading cause of vaccine-preventable childhood mortality. The classic signs and symptoms of measles include a high fever, coughing, conjunctivitis and a characteristic rash. Symptoms usually develop 7–14 days after exposure and 3 out of 10 people who get measles will develop one or more complications including pneumonia, encephalitis and death. There is no specific treatment for measles although in developed countries, children are immunized against measles at 12 months old as part of a three-part Measles, Mumps and Rubella vaccine. A recent increase in measles worldwide has been driven by unvaccinated people spreading the disease into countries where it was once declared eliminated. Measles is extremely infectious and among unimmunized people exposed to the virus, over 90% will contract the disease.

RECENT INCREASE IN MEASLES – USA CASES BY YEAR



DIAGNOSIS

Measles-specific IgM serology is the standard test for rapid laboratory diagnosis of measles. IgM testing using ELISA indirect capture methods or measles IgM capture are almost exclusively used. These assays require a pretreatment step to remove IgG antibodies and rheumatoid factor to ensure optimal performance. However, in regions where endemic measles virus has been eliminated, additional diagnostic assays are used to confirm measles cases irrespective of vaccination status. IgG avidity testing has proved useful in cases that require additional methods, such as suspected false negatives or a false positives.

REAGENTS FOR SEROLOGIC TESTING

7604	**Rubeola Native Antigen** • Prepared from a glycine extract of infected (Edmonston strain) Vero cells • >10% viral protein, partially purified to reduce host cell components and contains predominantly nucleocapsid antigens • Buffer: 0.1M Glycine, pH 9.3–9.7	IgG Detection for EIA Assays
EV9298	**Rubeola Virus Nucleoprotein Recombinant Antigen** • Produced in Sf9 insect cells, sequence derived from the Edmonston strain • Protein Concentration: 0.5 ± 0.1mg/mL by BCA • Buffer: 50mM Hepes, pH 7.5 ± 0.1	IgM Detection for EIA Assays

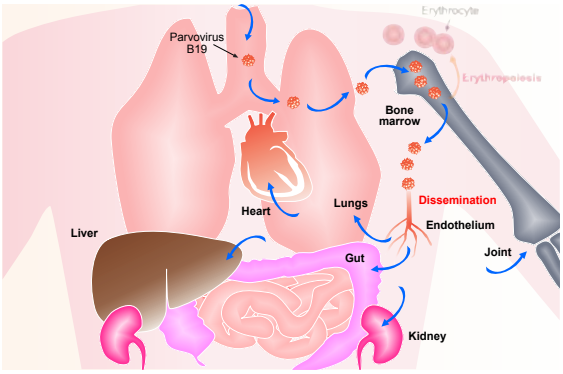
Parvovirus B19

The Parvoviridae family includes a large number of small, genetically-compact DNA viruses known collectively as parvoviruses. Parvovirus B19 was the first pathogenic human parvovirus to be discovered and it is best known for causing the childhood illness called fifth disease.

Aside from a characteristic rash, which is seen in both pediatric and adult patients, parvovirus B19 also causes fever, headaches, sore throat, arthralgias and anemia.In healthy individuals, this anemia is mild and of short duration, but in individuals with weakened immune systems the resulting anemia can be severe and long-lasting. It is particularly dangerous to pregnant women during mid-trimester, since it can cause hydrops fetalis, severe fetal anemia and possibly lead to miscarriage or stillbirth.

Parvovirus B19 spreads through respiratory secretions (such as saliva, sputum, or nasal mucus) when an infected person coughs or sneezes. It is highly contagious and a significant increase in the number of cases is seen every three to four years. Outbreaks are common, especially in nurseries and schools where both children and pregnant woman are at risk.

PARVOVIRUS B19 INFECTION CYCLE



Parvo B19 is transmitted by aerosol inhalation and the main target cells are erythroid progenitor cells in the bone marrow.

Source: Immunopaedia.org

DIAGNOSIS

Serologic testing has proven to be extremely useful and IgM antibodies can be detected approximately 10 days after the infection for about 30-60 days. The detection of an acute infection by IgM testing is critical to prevent outbreaks, and detection of IgG indicates the immune status of an individual (which is particularly important for pregnant women).

Human B19 encodes a number of nonstructural proteins, including the major protein, NS1, and two structural proteins, VP1 and VP2. During an acute infection, B19-specific antibodies to both linear and conformational epitopes are produced against VP1 and VP2. Specifically, IgG antibodies are formed against the linear epitopes of the C-terminal end of VP1 early in infection. These antibodies remain for about 6-12 months after which they significantly decline. In contrast, antibodies to the linear epitopes at the N-terminal end of VP1 and the entire VP2 protein are detectable for life.

IgM/IgG assays for B19 usually include detection of both the VP1 C-terminal (IgM response) and VP1 N-terminal and VP2 proteins (IgG response). In addition, detection of the B19 NS1 can be used as a supplement in case of borderline results by VP2.

REAGENTS FOR SEROLOGIC TESTING

R01638 | **Parvovirus B19 VP1 Recombinant**
- Represents a.a.1-781, full length VP1
- Produced in *E. coli* (contains a His tag), 95% pure (SDS-PAGE)
- Molecular Weight: 87 kDa
- Buffer: 50mM Tris/HCl pH 8.0, 500mM NaCl and 8M Urea

R01639 | **Parvovirus B19 VP2 VLP Recombinant**
- Virus-Like Particles (VLPs)of VP2 produced in Sf9 cells, 90% Pure (SDS-PAGE)
- Represents conformational epitope a.a.228-781
- Molecular Weight: 65 kDa
- Buffer: Phosphate Buffered Saline, pH7.4, 10% glycerol

IgG/IgM Antibody Detection for ELISA Assays

Continued over page

R01640	**Parvovirus B19 VP1 Recombinant** • Represents a.a. 1-230 of the VP1 protein (truncated N-terminal) • Produced in *E. coli* (contains a His tag), 95% pure (SDS-PAGE) • Molecular Weight: 26 kDa • Buffer: 50mM Tris/HCl pH 8.0, 500mM NaCl and 8M Urea	IgG/IgM Antibody Detection for ELISA Assays
R01641	**Parvovirus B19 VP1/2 Recombinant** • Represents a.a. 485-781 of the VP1 protein (C-terminal) • Produced in *E. coli* (contains a His tag), 95% pure (SDS-PAGE) • Molecular Weight: 35 kDa • Buffer: 50mM Tris/HCl pH 8.0, 500mM NaCl and 8M Urea	
R01642	**Parvovirus B19 VP1 Recombinant** • Represents a.a. 1-486 of the VP1 protein (N-terminal) • Produced in *E. coli* (contains a His tag), 95% pure (SDS-PAGE) • Molecular Weight: 54 kDa • Buffer: 50mM Tris/HCl pH 8.0, 500mM NaCl and 8M Urea	
R01643	**Parvovirus B19 VP1 Recombinant** • Represents a.a. 313-781 of the VP1 protein (C-terminal) • Produced in *E. coli* (contains a His tag), 95% pure (SDS-PAGE) • Molecular Weight: 55 kDa • Buffer: 50mM Tris/HCl pH 8.0, 500mM NaCl and 8M Urea	
R01644	**Parvovirus B19 VP2 Recombinant** • Represents VP1 linear epitope a.a. 233-781 • Produced in *E. coli* (contains a His tag), 95% pure (SDS-PAGE) • Molecular Weight: 63 kDa • Buffer: 50mM Tris/HCl pH 8.0, 500mM NaCl and 8M Urea	
R01637	**Parvovirus B19 NS1 Recombinant** • Produced in *E. coli* (contains a His tag), 95% pure (SDS-PAGE) • Molecular Weight: 78 kDa • Buffer: 50mM Tris/HCl pH 8.0, 500mM Sodium Chloride and 8M Urea	IgG/IgM Antibody Detection for ELISA Assays
C01718M	**MAb to Parvovirus B19** • Reacts with Human Parvovirus (B19) VP2	IFA Detection

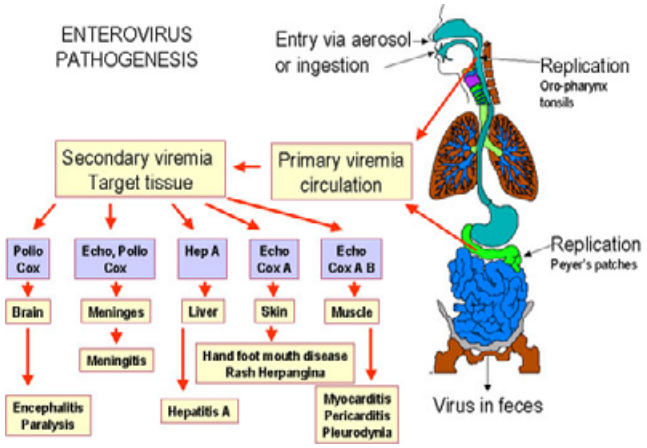
Enterovirus

Enteroviruses are small, very contagious RNA viruses that cause a wide spectrum of diseases in persons of all ages, although infection and illness occur most commonly in infants.

Enteroviruses infect an estimated 50 million people each year in the US and possibly a billion or more worldwide. Transmission occurs orally either via aerosol or ingestion of contaminated food. Approximately 50-80% of enterovirus infections are mild or asymptomatic, however they can also develop into severe and life threatening diseases. Each year, tens of thousands of people are hospitalized from enterovirus infections. Approximately 75% of enterovirus infections occur in children under 15 years of age and the occurrence rates are highest in children under 1 year of age.

Serologic studies have distinguished over 70 human enterovirus serotypes which are associated with 26 different syndromes and diseases, including coronary heart disease, type 1 diabetes, hand-foot-and-mouth disease, polio, and meningitis. Traditionally, enteroviruses were classified into four separate species: coxsackie, echovirus, enterovirus and poliovirus. However, due to large overlaps in their epidemiologic and clinical characteristics, their taxonomy has changed and newly identified viruses are now numbered starting with EV68. To date, the following enterovirus subtypes have been identified:

SUBTYPE	DISEASES
Poliovirus 1-3	Paralysis, aseptic meningitis, encephalitis, poliomyelitis
Coxsackie A1-A24	Herpangina, hand-foot-mouth, common cold
Coxsackie B1-B6	Pleurodynia, aseptic meningitis, encephalitis, pericarditis, myocarditis
Echovirus 1-9, 11-31	Paralysis, aseptic meningitis, encephalitis
Numbered Enteroviruses (eg. EV71)	Herpangina, hand-foot-mouth, conjunctivitis (EV70), aseptic meningitis



Enterovirus outbreaks are common in the summer and fall, though they can cause infections year-round in tropical parts of the world. Several serotypes have been responsible for large outbreaks including:

- **Enterovirus 71**: large outbreaks of Hand-Foot and-Mouth Disease (HFMD) worldwide, especially in children in Asia
- **Echovirus 13, 18, and 30**: several outbreaks of viral meningitis in the United States
- **Enterovirus D68**: infected children in 49 states in 2014 and hospitalized them with severe respiratory illness
- **Coxsackievirus A16 & A6**: the most common cause of HFMD in the United States
- **Coxsackievirus A24 & Enterovirus 70**: seasonal worldwide outbreaks of acute hemorrhagic conjunctivitis since the 1970's
- **Poliovirus**: killed over 500,000 people worldwide each year in the 1940's and 50's. Vaccines are now available

DIAGNOSIS

Laboratory diagnosis of enterovirus is important given that they can cause serious infections and surveillance is required to manage recurring outbreaks. Diagnostic methods include virus isolation, nucleic acid testing (NAT), and serological tests such as ELISA, complement fixation (CF), and neutralization assays. In particular, IgM EIAs have proven very useful due to their high specificity with the benefits of a lower cost and a reduced need for experienced personnel and dedicated laboratories. The application of IgM EIA is especially important in cases of meningitis when cerebral spinal fluid samples are not available and for the diagnosis of other enterovirus diseases with other clinical symptoms such as fever, enteritis, and HFMD. Also, the rapid serotype identification of enterovirus is important in differentiating non-poliovirus enterovirus pathogens from vaccine strain polioviruses that can be shed for some time after vaccination, especially in age groups in which oral poliovirus vaccines are usually administered.

REAGENTS FOR SEROLOGIC TESTING

R01570 | **EBV VCA p23 Recombinant Antigen**
- Represents the ORF of the BLRF2 gene (a.a. 2-162) coding for the EBV tegument protein BLRF2 (23kDa)
- Produced in *E. coli* (> 95% pure SDS-PAGE), lyophilized
- Lyophilized from 20 mM Phosphate Buffer, pH 8, 1 M Sodium Chloride

R01571 | **EBV VCA p18 Recombinant Antigen**
- Represents the truncated form of the viral capsid protein VP 26 (EBV gene BFRF3)
- Produced in *E. coli* (≥ 98% pure SDS-PAGE)
- Buffer: 20 mM PBS @ pH 7 and 1 M NaCl

IgM Detection for ELISA and WB Assays

C01670M | **MAb to Enterovirus 70**
- Reacts to most enterovirus type 70
- Non-reactive to many other Enteroviruses

C01700M | **MAb to Enterovirus Pan-reactive VP3**
- Reacts with VP3 of many enterovirus types
- Specifically reactive with: rhinovirus Type 1a, 2, 14, 16, 17, 27, 42, 70, 80, coxsackie A7, A9, A16, A2, coxsackie B1, B2, B3, B4, B5, B6, echovirus Types 4, 6, 9, 11, 30, 34, EV71 and poliovirus

C30510M | **MAb to Poliovirus 1**
- Developed using the Sabin vaccine strain of poliovirus 1

C30027M | **MAb to Poliovirus 3**
- Developed using the Sabin vaccine strain of poliovirus 3

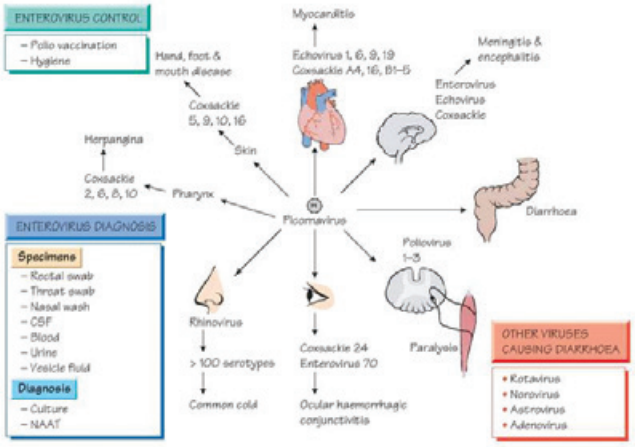
Antigen Detection ELISA and IFA Assays

Coxsackie

Coxsackievirus is a member of the *Picornaviridae* family of viruses and are subtype members of Enteroviruses. In cooler climates, outbreaks of coxsackie virus often occur in the summer and fall, though they can cause infections year-round in tropical parts of the world.

Coxsackieviruses spread from person to person, usually on unwashed hands of surfaces contaminated by feces. In most cases, coxsackieviruses cause mild flu-like symptoms and go away without treatment. But in some cases, and especially in infants, infections can lead to more serious diseases such viral meningitis, encephalitis and myocarditis.

There are two groups of coxsackie viruses which are divided based on their effects on newborn mice: coxsackie A, which results in muscle injury, paralysis, and death; and coxsackie B, which results in organ damage but overall has less severe outcomes. In total, there are 24 different serotypes of the virus and each serotype has distinct proteins on its viral surface. The most well known coxsackie A disease is hand-foot and-mouth disease (HFMD), a common childhood illness which affects mostly children aged 5 or under, and it is often from infection by coxsackie A16 or A6. Other diseases include acute haemorrhagic conjunctivitis (coxsackie A24 specifically), herpangina, and aseptic meningitis (both coxsackie A and B viruses). Coxsackievirus A7 can also cause polio-like permanent paralysis. There are six types of coxsackie B (B1-B6) and they tend to infect the heart, pleura, pancreas, and liver, causing pleurodynia, myocarditis, pericarditis,



Source: www.drugline.org

and hepatitis. Specifically coxsackie B2 and B5 viruses have been implicated in HFMD as well as respiratory infection and the B4 strain of coxsackievirus has been discovered to be a possible cause of diabetes mellitus type 1. Both group A and group B coxsackie viruses can cause nonspecific febrile illnesses, rashes, upper respiratory tract disease, and aseptic meningitis.

DIAGNOSIS

Neutralization tests are generally the best serological tests available for coxsackieviruses, however they are labor intensive and take at least 3 days before the results are available. Antibody titers are compared in paired sera, the first collected within 5 days of onset of symptoms and the second some days later and a significant rise in titer is evidence for a recent infection.

More recently, IgM capture assays have become available for various coxsackie A and B, and echovirus serotypes. However, cross-reactivity between the IgM responses to different enteroviruses, including hepatitis A, often occurs. The older the patient, the more likely such heterotypic responses will take place. Enterovirus IgM usually lasts 8 - 12 weeks but may persist longer in some patients. It has been suggested that a prolonged response of a few years may indicate a persistent infection in cases of recurrent pericarditis. Approximately 30 - 40% of patients with myocarditis, 60 - 70% of patients with aseptic meningitis, and 30% of patients with postviral fatigue syndrome give positive results for coxsackie B IgM. However, 10% of normal adults will also give a positive result, perhaps having experienced a recent enterovirus infection.

REAGENTS FOR SEROLOGIC TESTING

R17160	**Coxsackie A16 Native Antigen** • Antigen lysate produced in LLC-MK2 cells • G10 viral strain • Buffer: 0.1M Glycine • Heat inactivated	Antibody Detection for EIA Assays
R17900	**Coxsackie A9 Native Antigen** • Partially purified antigen produced in LLC-MK2 cells • P.B. Bozek viral strain • Harvested cell culture fluid is prepared by ultra-centrifugation to remove cellular components and the resulting supernatant is supplied as antigen • Heat inactivated	
R01517	**Coxsackie B1 Recombinant Antigen** • Tucson strain • Produced in *E. coli* from the C-terminus (amino acids 487-646) of the VP1 protein • Contains a His-tag at the N-terminus • Buffer: 8M Urea, 20mM Phosphate, pH 8.0, 1M Sodium Chloride, 0.1% Polyoxyethylene(10)Tridecylethe	Antibody Detection for ELISA & Western Blot Assays

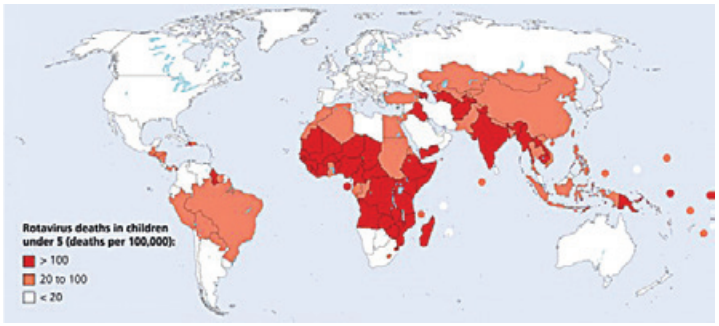
Rotavirus

Rotavirus is the leading cause of viral gastroenteritis in children worldwide. Symptoms include severe dehydrating diarrhea, vomiting, and fever. Over 600,000 deaths occur annually and mostly in developing countries, due to dehydration caused by the infection.

Rotavirus is one of nine genera in the family Reoviridae and it is subdivided into seven serogroups (A to G) on the basis of its antigenic and genetic properties. The members of each serogroup share a common group antigen located on the major inner capsid protein, VP6, which is also the most prevalent protein in the rotavirus particle and is highly immunogenic. Only rotaviruses in groups A to C have been associated with disease in humans. Group A rotaviruses are the major cause of gastroenteritis in children worldwide, with a peak incidence among children between 6 months and 2 years of age.

ROTAVIRUS DEATHS IN CHILDREN UNDER 5

(Deaths per 100,000)



Source: World Health Organisation

Rotavirus can produce a spectrum of illnesses ranging from subclinical infection to severe occasionally fatal dehydration. Typically the clinical presentation after a 3-day incubation period is 3 days of vomiting and 5 days of watery diarrhea with a moderate fever. In temperate climates, it peaks during the winter season. Although discovered as a human pathogen only 32 years ago, the role of the virus as a course of diarrheal disease in developed and developing countries was quickly identified.

DIAGNOSIS

Diagnosis for rotavirus was originally performed using electron microscopy, which is still occasionally used in laboratories where it is available. Routine diagnosis is now most commonly performed by antigen detection using commercially available, simple rapid assays, latex particle agglutination and enzyme immunoassays (EIA). Since rotavirus is shed in such high concentrations in stool, fecal specimens are preferred for diagnosis of rotavirus.

As nearly all rotavirus strains infecting humans belong to group A, the standard antigen detection in routine clinical use detects only group A and commercially available kits are based on detection of the VP6 antigen of group A rotaviruses. Serologic tests, although less commonly used due to high seropositivity, can detect a rise in serum IgG and IgA antibodies for recent infections. Serum IgA has also been the most widely used marker for rotavirus infection in vaccine trials, and is the best serologic indicator of reinfection. There are no commercial kits available to measure rotavirus antibodies.

REAGENTS FOR DIAGNOSTIC TESTING

7844	**Rotavirus Native Antigen** • Prepared from an extraction of MA104 cells infected with the Rotavirus SA-11 • Partially purified to reduce host cell components, ~ 60% viral protein • Available for use in ELISA test kits as a positive control antigen for serological testing	Positive Control or Antibody Detection for EIA Assays
C66130M	**MAb to Rotavirus, VP6** • Rotavirus group A specific antigen VP6 • Reacts with strains EDIM, SA-11, WA, and bovine NCDV strains • Can be used for stool testing	Antigen Detection for EIA Assays (Including stool testing)
C86310M	**MAb to Rotavirus VP6** • Reacts with Rotavirus p42 inner-capsid antigen (VP6) • Cross-reacts with monkey rotavirus (SA-11), porcine rotavirus (PP) and human rotaviruses (field strains)	Antigen Detection for Lateral Flow Assays
C01729M	**MAb to Rotavirus** • Reacts with intact virus of strains Rhesus Rotavirus and Human Rotavirus WA, SA-11 strains • Does not react with Influenza A, Influenza B, Parainfluenza, Adenovirus, *M. pneumonia* and *H. pylori* • Capture Ab, can be used for stool testing	Paired Abs for Antigen Detection, MAbs, Lateral Flow or ELISA Assays
C01730M	**MAb to Rotavirus** • Reacts with intact virus of strains Rhesus Rotavirus and Human Rotavirus WA, SA-11 strains • Does not react with Influenza A, Influenza B, Parainfluenza, Adenovirus, *M. pneumonia* and *H. pylori* • Detection Ab, can be used for stool testing	
B01235S	**Sheep anti-Rotavirus** • Recognizes all human rotavirus serotypes • Also works in ELISA	IFA Detection
B65110G	**Goat anti-Rotavirus NCDV (all antigens)** • Reactive against ICPs & late structural (virion) antigens • Cross reactivity is > 90% with human rotaviruses • Uninfected cell reactivity is negative against HEp-2 cells and WI-38 cells by indirect immunofluorescence	

Respiratory Syncytial Virus (RSV)

Respiratory syncytial virus (RSV) was discovered in 1956 and has since been recognized as one of the most common causes of childhood illness. It is a respiratory virus that infects the lungs and breathing passages and causes mild, cold-like symptoms in healthy people. For infants and older adults, RSV can lead to serious illnesses such as bronchiolitis and pneumonia.

RSV is a member of the Paramyxoviridae family and the Pneumovirinae subfamily. It is an enveloped RNA virus and two strains (subgroups A and B) are recognized, the clinical significance of which is unclear. RSV is the most common cause of bronchiolitis (inflammation of the small airways in the lung) and pneumonia in children younger than 1 year of age in the United States. Symptoms usually appear within 4 to 6 days of infection and healthy people usually recover in a week or two. When infants and children are exposed to RSV for the first time:

- 25 to 40 out of 100 will have signs or symptoms of bronchiolitis or pneumonia
- 5 to 20 out of 1,000 will require hospitalization (most children hospitalized for RSV infection are younger than 6 months of age)

RSV spreads from direct and indirect contact with nasal or oral secretions from infected people. The virus can survive on hard surfaces such as tables and crib rails for many hours, and on soft surfaces such as tissues and hands for shorter amounts of time. Researchers are developing an RSV vaccine, but none is available yet. There is no specific treatment for RSV. In the United States, 60% of infants are infected during their first RSV season, and nearly all children will have been infected with the virus by 2–3 years of age. RSV infections generally occur during fall, winter, and spring but the timing and severity of RSV circulation in a given community can vary from year to year.

DIAGNOSIS

Several different types of laboratory tests are available for the diagnosis of an RSV infection including ELISA, rapid lateral flow, Direct Fluorescent Antibody Detection (DFA), neutralization assay and RT-PCR. Most clinical laboratories currently utilize EIA antigen detection tests, and many supplement antigen testing with cell culture or immunofluorescence assays to confirm diagnosis.

Antigen detection tests and culture are generally reliable in young children but less useful in older children and adults. Because of its thermolability, the sensitivity of RSV isolation in cell culture from respiratory secretions can vary among laboratories. IgG and IgM antibody tests are used less frequently for routine diagnosis. Although useful for seroprevalence and epidemiologic studies, a diagnosis using paired acute- and convalescent-phase sera to demonstrate a significant rise in antibody titer to RSV cannot be made in time to guide patient care.

REAGENTS FOR SEROLOGIC TESTING

C66432M	**MAb to RSV** • Recognizes the nucleoprotein of RSV in extracts of live virus • Not recommended for use with inactivated virus	Antigen Detection for Dot Blot and Lateral Flow Assays
C01694M	**MAb to RSV, Long Strain** • Recognizes the F protein of RSV • Reactive with surface domain of both mature RSV virions and virion envelopes without formed inner nucleocapsid structures • Does not react with Influenza A (H1N1), Influenza A (H3N2), Influenza B, Parainfluenza 1,2,3 or Adenovirus	Antigen Detection for ELISA and Lateral Flow Assays

MAb to RSV
- Specific for the fusion protein of RSV, types A & B

C65063M
- Negative cross-reactivity with HEp-2 cells
- Capture antibody

C65065M
- Neutralizes
- Detection antibody

Paired MAbs for Antigen Detection Lateral Flow or ELISA Assays and IFA Detection

MAb to RSV Fusion Protein
- No cross reaction with Influenza A, Influenza B or Adenovirus
- Recognizes the fusion protein of both A & B RSV strains

C01770M
- Capture antibody

C01776M
- Detection antibody
- Specifically recognizes domain III

MAb to RSV Fusion Protein
- Recognizes the fusion protein of both A & B RSV strains
- No cross reaction with Influenza A, Influenza B or Adenovirus

C01775M
- Capture antibody

C01773M
- Detection Antibody

C01774M
- Alternate Detection Antibody

MAb to RSV Fusion Protein
- Recognizes the fusion protein of both A & B RSV strains
- No cross reaction with Influenza A, Influenza B or Adenovirus

C01769M
- Capture Antibody

C01770M
- Alternate Capture Antibody

C01774M
- Alternate Capture Antibody

C01773M
- Detection Antibody

Paired MAbs for Antigen Detection ELISA Assays

C87610M | **MAb to RSV Fusion Protein**
- Recognizes an RSV fusion protein (46 kDa and 22 kDa s-s linked glycoprotein)

IFA Detection

B65860G | **Goat anti-RSV**
- Reacts with all RSV viral antigens
- Reacts well with bovine isolates
- Does not react with Para 1-3, Influenza A & B or Adenovirus by IFA
- Negative against HEp-2 cells and WI-38 cells

Antigen Detection for EIA and IFA Assays

8175 | **RSV Grade II Native Antigen**
- >10% viral protein partially purified extraction (Long strain)
- Propagated in FRhK cells
- Buffer: PBS, pH 7.3-7.7, no preservative

Positive Control or Antibody Detection for EIA Assays

Increasing Assay Sensitivity

SOLID PHASE BLOCKING BUFFERS

Solid phase blocking buffers are designed to efficiently prevent non-specific binding, reduce background noise, and stabilize coated proteins to enable more sensitive immunoassays. They work by blocking unoccupied spaces on the surface to prevent non-specific binding to this surface by other proteins or biomolecules.

Recommended Reagents:

J82100B	Blocking Buffer for ELISA
J82300B	Blocking Buffer for Lateral Flow, PBS Based
J16430D	Coating Stabilizer and Blocking Buffer

IgG ABSORBANTS AND RF

The sensitivity and specificity of IgM detection can be compromised by the presence of IgG in the patient sample. There are two major mechanisms by which IgG can interfere with assays for IgM and cause a false result:

1. by competing with specific IgM for substrate binding sites
2. by forming immune complexes with Rheumatoid Factor (RF) which can compete with specific IgM for substrate binding sites

Removal of IgG and RF-IgM can be accomplished by treating the patient specimen with goat anti-human IgG.

Recommended Reagents:

L15406G	**Goat anti-human IgG FC (GAHG)** Dilute prior to adding to patient sample. Recommend diluting 1:10 in PBS. Add in a ratio of 1:10 to patient sample and allow to incubate 5-30 minutes.
8120	**IgM Diluent** In a separate tube, dilute the patient serum sample in the IgM Assay diluent at a 1:21 dilution or greater (mix well). The diluent must be standardized as a unit with the other assay components.

HOW TO USE BLOCKING BUFFER AND GAH IgG

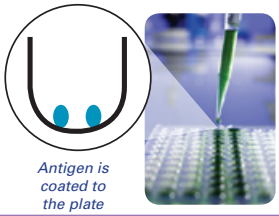
General Protocol

STEP 1 Optimize the plate/nitrocellulose-coating conditions for the antigen

A. Coat the plate with antigen: 2-10 µg/mL solution of protein dissolved in an alkaline buffer such as phosphate-buffered saline (pH 7.4) or carbonate-bicarbonate buffer (pH 9.4)

B. Incubate plate for several hours to overnight at 4-37°C

C. Remove coating solution, perform wash steps



Antigen is coated to the plate

STEP 2 Add blocking buffer

A. Add the blocking solution directly to the wells, blotting membrane or nitrocellulose membrane depending on the assay type being used.
Use at 1X concentration or with further dilution

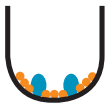
ELISA Blocking Buffer: Cat# J82100B

Lateral Flow Blocking Buffer: Cat# J82300B

Coating Stabilizer & Blocking Buffer: Cat# J16430D

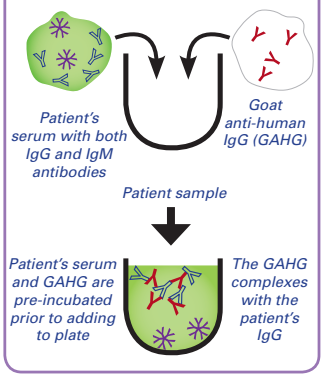
B. Incubate at room temperature for 30 minutes to 2 hours

C. Continue with your process and reagents according to the assay protocol



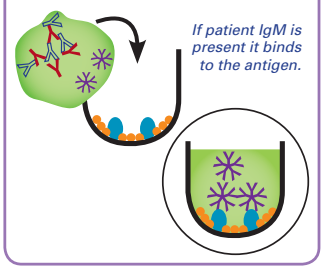
STEP 3 Pre-incubate GAHG with the patient's serum

A. Dilute GAH IgG 1:10 in PBS
B. Add diluted GAH IgG to patient sample 1:10 and mix
C. Incubate for 3-5 min and proceed with sample testing



STEP 4 Add patient sample mixture to the reaction well

A. Incubate patient sample with the antigen
B. Perform wash steps: remove non-bound reagents



STEP 5 Detection by direct or indirect methods

Complimentary Reagents

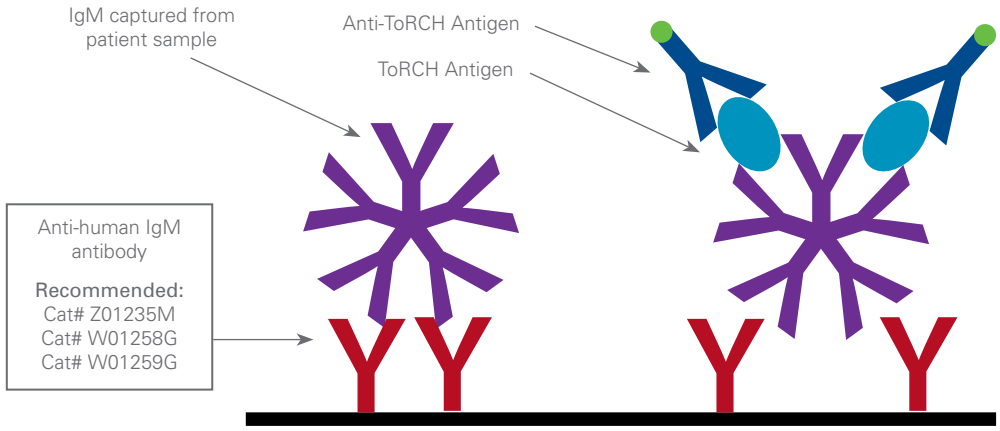
ANTI-HUMAN IGM FOR IGM CAPTURE ASSAYS

Anti-human IgM antibodies suitable for both ELISA and lateral flow rapid IgM capture assays

Z01235M | **MAb to Human IgM**
- Recognizes human IgM
- Does not cross react with other human immunoglobulin classes

W01258G | **Goat anti-human IgM (mu chain)**
- No cross-reactivity with non-immunoglobulin human serum proteins (IEP)
- No cross-reactivity with light chains on all human immunoglobulins (IEP)

W01259G | **Goat anti-human IgM (mu chain)**
- No cross-reactivity to human IgA and IgG
- No cross-reactivity with non-immunoglobulin human serum proteins (IEP)
- No cross-reactivity with light chains on all human immunoglobulins (IEP)



GENERAL ASSAY PRINCIPLE

1. Solid-phase is coated with anti-human IgM (MAb or PAb Blocking buffer is added to block the remaining binding site)
2. IgM-specific antibodies in the patient's sample bind to the anti-human IgM
3. Antigen (e.g. Rubella, toxo) is added in excess and a antibody-antigen-antibody complex forms
4. Detection can either be by direct or indirect methods

Product List

ABBREVIATIONS

Ab	Antibody
Ag	Antigen
Asp	Aspartic acid
BSA	Bovine Serum Albumin Conjugated
CLIA	Chemiluminescence Immunoassay
CSF	Cerebrospinal fluid
CHAPS	3-[(3-cholamidopropyl)dimethylammonio] -1-propanesulfonate
DB	Dot Blot
DFA	Direct Immunofluorescence Assay
EDTA	Ethylenediaminetetraacetic acid
EIA, ELISA	Enzyme Immunoassay, Enzyme-linked immunosorbent assay
ELISPOT	Enzyme-Linked ImmunoSpot
FCS	Fetal Calf Serum
GST	Glutathione S-transferase
GSH	Glutathione
HFMD	Hand Foot and Mouth Disease
HI	Hemagglutination Inhibition
IEP	Immunoglobulins
IgG	Immunoglobin G
IgM	Immunoglobin M
IFA	Immunofluorescence Assay
LF	Lateral Flow
Lysate	Cells which have been lysed
Met	Methionine
MAb	Monoclonal antibody
PAb	Polyclonal antibody
OD	Optical density
PBS	Phosphate Buffer Saline
PCR	Polymerase Chain Reaction
Purified	Refer to the Product Specification Sheet regarding the extent of purification and the purification process used.
RF	Rheumatoid Factor
SDS-PAGE	Sodium dodecyl sulfate polyacrylamide gel electrophoresis
WB	Western Blot
UV-Vis	Ultraviolet–visible spectroscopy

Coxsackievirus

Coxsackieviruses belongs to the genus Enterovirus and causes mild flu-like symptoms that generally go away without treatment. In some cases, especially in infants, infections can lead to more serious diseases such as viral meningitis, encephalitis and myocarditis. Outbreaks of coxsackievirus often occur in the summer and fall, though they can cause infections year-round in tropical parts of the world.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Coxsackie A9	Ag	R17900	LLC-MK2 Cells	EIA, WB	Lysate	–
Coxsackie A16	Ag	R17160	LLC-MK2 Cells	EIA, WB	Lysate	–
Coxsackievirus B1 (Tucson strain) VP1, Recombinant	Ag	R01517	*E. coli*	EIA, WB	Purified	–

Cytomegalovirus (CMV)

CMV infection is typically asymptomatic in healthy persons, however immunocompromised individuals and newborn infants are at high-risk of developing life-threatening complications from primary infections and reactivations. Congenital cytomegalovirus specifically refers to a group of symptoms that occur when an infant is infected with CMV before birth. The risk for congenital CMV is almost exclusively associated with women who are having their first infection during pregnancy.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Cytomegalovirus (CMV) IgM Antigen (strain AD169) Concentrate	Ag	7511	HF Cells	EIA,WB	Partially Purified	–
Cytomegalovirus (CMV) Antigen, >10% Viral Protein	Ag	7504	HF Cells	EIA	Partially Purified	–
Cytomegalovirus (CMV) EXT-2 Antigen (strain AD169) >10% Viral Protein	Ag	7517	HF Cells	EIA	Partially Purified	–
Cytomegalovirus (CMV) Grade II	Ag	EV9268	HF Cells	EIA,WB	Purified	–
Cytomegalovirus (CMV) Grade III, >60% Viral Protein	Ag	7507	HF Cells	EIA,WB	Purified	–
Cytomegalovirus (CMV) IgG/IgM Antigen, Concentrate (strain AD169)	Ag	7600	MRC-5 Cells	CLIA, EIA, WB	Lysate	–
Cytomegalovirus (CMV) gB Antigen	Ag	EV7509	HF Cells	EIA,WB	Purified	–
Cytomegalovirus (CMV) gB (strain C194) Recombinant	Ag	R18102	*E. coli*	EIA,WB	Purified	–
Cytomegalovirus (CMV) pp38 (UL80a) (strain AD169) Recombinant	Ag	R18512	*E. coli*	EIA,WB	Purified	–
Cytomegalovirus (CMV) pp52 (UL44) Recombinant	Ag	R01565	*E. coli*	EIA	Purified	–
Cytomegalovirus (CMV) pp52 (UL44) Recombinant	Ag	R18062	*E. coli*	EIA,WB	Purified	–
Cytomegalovirus (CMV) pp65 (UL83) (strain AD169) Recombinant	Ag	R18412	*E. coli*	EIA,WB	Purified	–
Cytomegalovirus (CMV) pp65 (UL83) Recombinant	Ag	R01562	*E. coli*	EIA,WB	Purified	–
Cytomegalovirus (CMV) pp72 (UL123) Recombinant	Ag	R01524	*E. coli*	EIA,WB	Purified	–
Cytomegalovirus (CMV) pp150 (UL32) (strain AD169) Recombinant	Ag	R18113	*E. coli*	EIA,WB	Purified	–
Cytomegalovirus (CMV) pp150 (UL32) Recombinant	Ag	R01563	*E. coli*	EIA,WB	Purified, Liquid	–
Cytomegalovirus (CMV) pp150 (UL32) Recombinant	Ag	R01564	*E. coli*	EIA	Purified	–
Cytomegalovirus (CMV) Glycoprotein B	MAb	C65826M	Mouse	EIA,IFA	Purified	IgG1
Cytomegalovirus (CMV) Glycoprotein B	MAb	C8A024M	Mouse	EIA,IFA,WB	Purified	IgG1
Cytomegalovirus (CMV) Glycoprotein gH	MAb	C65861M	Mouse	EIA,IFA	Purified	IgG1
Cytomegalovirus (CMV) pp65	MAb	C01245M	Mouse	IFA	Purified	IgG1
Cytomegalovirus (CMV) pp65	MAb	C8A023M	Mouse	EIA,IFA,WB	Purified	IgG1
Cytomegalovirus (CMV) 65kDa, EA	MAb	C86314M	Mouse	EIA,WB	Purified	IgG2a
Cytomegalovirus (CMV) 65kDa, LA	MAb	C65089M	Mouse	IFA,WB	Purified	IgG
Cytomegalovirus (CMV) 70kDa, IEA	MAb	C65841M	Mouse	IFA,WB	Purified	IgG1
Cytomegalovirus (CMV) pp72 IEA	MAb	C8A022M	Mouse	EIA,IFA,WB	Purified	IgG2a
Cytomegalovirus (CMV) (strain AD169)	PAb	B47821R	Rabbit	EIA,IFA	Neat	–

Enterovirus

Over 71 different serotypes exist and are categorized into four main groups: polioviruses, coxsackie A viruses, coxsackie B viruses, and echoviruses. Most recently they are named using consecutive numbers: EV68, EV69, EV70, EV71, etc. Enteroviruses affect millions of people worldwide each year with approximately 75% of enterovirus infections occurring in children under 15 years of age. Many infections are self-limiting but they can be life-threatening.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Enterovirus 70	MAb	C01670M	Mouse	EIA,IFA	Purified	IgG3
Enterovirus Pan-reactive VP3	MAb	C01700M	Mouse	EIA,IFA	Purified	IgG2a

Product List *continued*

Epstein Barr Virus (EBV)

EBV, also called human herpesvirus 4 (HHV-4), is a virus of the herpes family and infects more than 95% of the world's population. The most common manifestation of primary infection with this organism is acute infectious mononucleosis, a self-limited clinical syndrome that most frequently affects adolescents and young adults.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Epstein Barr Virus (EBV) Antigen, >10% Viral Protein	Ag	7420	P3HR-1 Cells	EIA	Partially Purified	–
Epstein Barr Virus (EBV) VCA (gp125) Antigen	Ag	8202	P3H3 Cells	EIA, WB, LF, CLIA	Purified	–
Epstein Barr Virus (EBV) Antigen	Ag	R02100	P3H3 Cells	EIA	Lysate	–
Epstein Barr Virus (EBV) Early Antigen-D, Recombinant	Ag	R18740	*E. coli*	EIA,WB	Purified	–
Epstein Barr Virus (EBV) Nuclear Antigen-1 (EBNA-1) Recombinant	Ag	R01522	*E. coli*	EIA,WB	Purified	–
Epstein Barr Virus (EBV) p23, Recombinant	Ag	R18230	*E. coli*	EIA,WB	Purified	–
Epstein Barr Virus (EBV) p138, Early Antigen-D (EA-D) Recombinant	Ag	R01525	*E. coli*	EIA,WB	Purified	–
Epstein Barr Virus (EBV) Nuclear Antigen-1 (EBNA-1)	PAb	B65102G	Goat	EIA,IFA	Purified	–
Epstein Barr Virus (EBV) Early Antigen (BAM HI-Z) Zeta Protein	MAb	C65506M	Mouse	EIA,IHC(p), IP,WB	Purified	IgG2
Epstein Barr Virus (EBV) Early Antigen-D	MAb	C65026M	Mouse	IFA,WB, IHC	Purified	IgG2
Epstein Barr Virus (EBV) Early Antigen-R Homologue Bcl-2	MAb	C65502M	Mouse	EIA,IHC(p), IP,WB	Purified	IgG1
Epstein Barr Virus (EBV) gp220/350	MAb	C65221M	Mouse	IFA, WB	Purified	IgG1
Epstein Barr Virus (EBV) gp220/350	MAb	C65223M	Mouse	IFA	FITC	IgG1
Epstein Barr Virus (EBV) Latent Membrane Protein 2A (LMP2A)	MAb	C01285R	Rat	IHC(p),WB	Purified	IgG1
Epstein Barr Virus (EBV) Viral Capsid Antigen (VCA) p18, Recombinant	Ag	R01571	*E. coli*	EIA,WB	Purified	–
Epstein Barr Virus (EBV) Viral Capsid Antigen (VCA) p23, Recombinant	Ag	R01570	*E. coli*	EIA,WB	Purified	–
Epstein Barr Virus (EBV) Viral Capsid Antigen (VCA)	MAb	C65023M	Mouse	IFA	Purified	IgG1
Epstein Barr Virus (EBV) Viral Capsid Antigen (VCA) gp125	MAb	C66405M	Mouse	EIA,IFA,WB	Purified	IgG1,k

Herpes Simplex Virus Type 1 (HSV-1) & Herpes Simplex Virus Type 2 (HSV-2)

HSV infections are common worldwide, however the majority of infected individuals remain undiagnosed. HSV-1 is usually transmitted during childhood through contact with oral secretions (cold sores). HSV-2 is the main cause of neonatal HSV infection (70-85%) and develop into congenital HSV which has serious consequences including death.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Herpes Simplex Virus Type 1 (HSV-1) Antigen (strain F) >10% Viral Protein	Ag	7305	Vero Cells	EIA, WB	Partially Purified	–
Herpes Simplex Virus Type 1 (HSV-1) Antigen (strain F) Concentrate	Ag	7309	Vero Cells	EIA, WB	Partially Purified	–
Herpes Simplex Virus Type 1 (HSV-1) Glycoprotein D Glycosylated, Recombinant	Ag	VTI510	*P. Pastoris*	CLIA, WB	Purified	–
Herpes Simplex Virus Type 1 (HSV-1) Glycoprotein D, Recombinant	Ag	R18430	*E. coli*	EIA,WB	Purified	–
Herpes Simplex Virus Type 1 (HSV-1) Glycoprotein G, Recombinant	Ag	VTI520	*S. cerevisiae*	CLIA, WB	Purified	–
Herpes Simplex Virus Type 1 (HSV-1)	MAb	C01290M	Mouse	EIA	Purified	IgG2a
Herpes Simplex Virus Type 1 (HSV-1)	MAb	C01291M	Mouse	EIA	Purified	IgG3

Herpes Simplex Virus Type 1 (HSV-1) & Herpes Simplex Virus Type 2 (HSV-2) continued

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Herpes Simplex Virus Type 1 (HSV-1) Glycoprotein C	MAb	C65141M	Mouse	IFA	Purified	IgG2
Herpes Simplex Virus Type 1 (HSV-1) Glycoprotein D	MAb	C8A020M	Mouse	EIA,IP,WB	Purified	IgG1
Herpes Simplex Virus Type 1 (HSV-1) Glycoprotein E	MAb	C65120M	Mouse	EIA, IFA	Purified	IgG
Herpes Simplex Virus Type 1 (HSV-1) Glycoprotein G-1	MAb	C66150M	Mouse	IFA,WB	Purified	IgG2a
Herpes Simplex Virus Type 1 (HSV-1) Nucleocapsid Protein (155kDa)	MAb	C05014MA	Mouse	IFA,IP,WB	Purified	IgG1
Herpes Simplex Virus Type 1 (HSV-1)	PAb	B65131G	Goat	EIA,IFA	Purified	–
Herpes Simplex Virus Type 1 (HSV-1)	PAb	B65133G	Goat	EIA, IFA	FITC	–
Herpes Simplex Virus Type 1 (HSV-1)	PAb	B65134G	Goat	EIA	HRP	–
Herpes Simplex Virus Type 2 (HSV-2) Antigen (strain G) >10% Viral Protein	Ag	7705	Vero Cells	EIA	Partially Purified	–
Herpes Simplex Virus Type 2 (HSV-2) Antigen (strain G) Concentrate	Ag	7749	Vero Cells	EIA	Partially Purified	–
Herpes Simplex Virus Type 2 (HSV-2) Glycoprotein D, Glycosylated, Recombinant	Ag	VTI540	*P. Pastoris*	EIA,WB	Purified	–
Herpes Simplex Virus Type 2 (HSV-2) Glycoprotein D, Recombinanat	Ag	R18530	*E. coli*	EIA,WB	Purified	–
Herpes Simplex Virus Type 2 (HSV-2) Glycoprotein G, Recombinant	Ag	VTI530	*S. cerevisiae*	EIA,WB	Purified	–
Herpes Simplex Virus Type 2 (HSV-2) Glycoprotein G	Ag	EV9287	Vero Cells	EIA	Purified	–
Herpes Simplex Virus Type 2 (HSV-2) Glycoprotein G, Recombinant	Ag	R18350	*E. coli*	EIA,WB	Purified	–
Herpes Simplex Virus Type 2 (HSV-2)	MAb	C01292M	Mouse	–	Purified	IgG2a
Herpes Simplex Virus Type 2 (HSV-2) Glycoprotein D	MAb	C86302M	Mouse	WB, EIA	Purified	IgG1
Herpes Simplex Virus Type 2 (HSV-2) Glycoprotein D	MAb	C01859M	Mouse	EIA, IFA	Purified	IgG1
Herpes Simplex Virus Type 2 (HSV-2) Glycoprotein E	MAb	C65901M	Mouse	EIA	Purified	IgG2
Herpes Simplex Virus Type 2 (HSV-2) Glycoprotein G	Ag	R01594	Synthetic	EIA, WB	Purified	-
Herpes Simplex Virus Type 2 (HSV-2) Glycoprotein G	MAb	C65116M	Mouse	IFA	Purified	IgG
Herpes Simplex Virus Type 2 (HSV-2) Glycoprotein G-2	MAb	C66501M	Mouse	WB	Ascites	IgG1
Herpes Simplex Virus Type-2 (HSV-2) Glycoprotein G-2	MAb	C66516M	Mouse	WB	Purified	IgG1
Herpes Simplex Virus Type 2 (HSV-2)	PAb	B65121S	Sheep	EIA,IFA,WB	Purified	–
Herpes Simplex Virus Type 2 (HSV-2)	PAb	B65123S	Sheep	EIA, IFA	FITC	–
Herpes Simplex Virus Type 2 (HSV-2)	PAb	B65124S	Sheep	EIA, IFA	HRP	–
Herpes Simplex Virus Types 1 & 2 (HSV-1&2)	PAb	B65107R	Rabbit	IFA, WB	Purified	–
Herpes Simplex Virus Types 1 & 2 (HSV-1&2)	PAb	B65205R	Rabbit	EIA, ICC	HRP	–
Herpes Simplex Virus Types 1 & 2 (HSV-1&2) Glycoprotein D	MAb	C01294M	Mouse	EIA,Pr	Purified	IgG2a
Herpes Simplex Virus Types 1 & 2 (HSV-1&2) Glycoprotein D	MAb	C65912M	Mouse	EIA,IFA	Purified	IgG1

Herpes Virus Type 6 (HHV-6)

A member of the herpes virus family, HHV-6B primary infection is the cause of the common childhood illness exanthem subitum (also known as roseola infantum or sixth disease). Roseola infantum is a common, mild virus that can cause a temperature and rash in babies and young children. It usually lasts about 3-5 days and generally does not need medical treatment. Ninety-five percent of children have been infected with roseola by the age of two.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Herpes Virus Type 6 (HHV 6) 37kDa EA	MAb	C65206M	Mouse	EIA,IFA,IHC, IP,WB	Purified	IgG1
Herpes Virus Type 6 (HHV 6) gp60/110	MAb	C65020M	Mouse	EIA,IFA,IHC, IP,WB	Purified	IgG2
Herpes Virus Type 6 (HHV 6) p150	MAb	C65200M	Mouse	EIA,IFA,IHC,IP	Purified	IgG2

Product List *continued*

Lymphocytic choriomeningitis Virus (LCMV)

A rodent-borne disease that presents as aseptic meningitis, encephalitis or meningoencephalitis and is a particular concern in obstetrics, as vertical transmission is known to occur. If infection occurs during the first trimester, LCMV results in an increased risk of spontaneous abortion. Later congenital infection may lead to malformations such as intracranial calcifications, hydrocephalus, microcephaly or macrocephaly, mental retardation, and seizures.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Lymphocytic Choriomeningitis Virus (LCMV)	MAb	C44104M	Mouse	IFA,IHC(f),WB	Supernatant	IgG1

Mumps

A highly contagious disease that predominantly affects children. In general only supportive care is needed but occasionally it can cause serious complications. Even though a routine vaccination program was introduced in the United States in 1967, small outbreaks among unvaccinated people are still common.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Mumps (strain Enders) >10% Viral Protein	Ag	8099	LLC-MK2 Cells	EIA, CLIA	Partially Purified	–
Mumps Grade III	Ag	EV9529	Cell Culture	EIA,WB	Purified	–
Mumps Virus Nucleoprotein	MAb	C01719M	Mouse	EIA,IFA	Purified	IgG2a
Mumps Virus Nucleoprotein	MAb	C01720M	Mouse	EIA,IFA	Purified	IgG2b
Mumps Virus Nucleoprotein	MAb	C01721M	Mouse	EIA,IFA	Purified	IgG2b

Parvovirus B19

Best known for causing the childhood illness fifth disease that results in a characteristic rash. It is particularly dangerous to pregnant women during mid-trimester, since it can cause hydrops, fetalis, severe fetal amemia and possibly lead to miscarriage or stillbirth.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Parvovirus B19 NS1 Recombinant	Ag	R01637	*E. coli*	EIA	Purified	–
Parvovirus B19 VP1 Recombinant	Ag	R01638	*E. coli*	EIA	Purified	–
Parvovirus B19 VP2 VLP Recombinant	Ag	R01639	Sf9 Insect Cells	ELISA	Purified	–
Parvovirus B19 VP1 (a.a. 1-230) Recombinant	MAb	R01640	*E. coli*	EIA	Purified	–
Parvovirus B19 VP1/2 (a.a.485-781) Recombinant	Ag	R01641	*E. coli*	EIA	Purified	–
Parvovirus B19 VP1 (a.a. 1-486) Recombinant	Ag	R01642	*E. coli*	EIA	Purified	–
Parvovirus B19 VP1 (a.a. 313-781) Recombinant	Ag	R01643	*E. coli*	EIA	Purified	–
Parvovirus B19 VP2 (a.a.233-781) Recombinant	Ag	R01644	*E. coli*	ELISA	Purified	–
Parvovirus B19 VP1 (a.a. 313-781) Recombinant	Ag	C01718M	Mouse	EIA,IFA	Purified	IgG1

Poliovirus

The causative agent of poliomyelitis (commonly known as polio) is a disease of the central nervous system. It is a human enterovirus with infection occurs via the fecal–oral route.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Poliovirus	MAb	C30027M	Mouse	IFA	Ascities	IgG2a
Poliovirus	MAb	C30510M	Mouse	IFA	Ascities	IgG1

Rotavirus

Group A rotaviruses are the major cause of gastroenteritis in children worldwide, with a peak incidence among children between 6 months and 2 years. It can produce a spectrum of illnesses ranging from subclinical infection to severe and, on occasion fatal dehydration.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Rotavirus Antigen (strain SA-11) >60% Viral Protein	Ag	7844	MA104 Cells	EIA	Partially Purified	–
Rotavirus	MAb	C01729M	Mouse	EIA,LF,Pr, WB	Purified	IgG2a
Rotavirus	MAb	C01730M	Mouse	EIA,LF,Pr, WB	Purified	IgG2b
Rotavirus	MAb	C65194M	Mouse	EIA,IFA,Pr	Purified	IgG2b
Rotavirus	MAb	C65196M	Mouse	EIA,IFA,Pr	Purified	IgG2b
Rotavirus	MAb	C65197M	Mouse	EIA,IFA,Pr	Purified	IgG2a
Rotavirus (all serotypes)	PAb	B01235S	Sheep	EIA,IFA	Purified	–
Rotavirus broad reactivity	MAb	C65521M	Mouse	EIA,WB	Purified	IgG2a
Rotavirus Group A Specific Antigen, Vp6	MAb	C01295M	Mouse	EIA	Purified	IgG1
Rotavirus Group A Specific Antigen, Vp6	MAb	C66130M	Mouse	EIA	Purified	IgG2a,k
Rotavirus Vp7	MAb	C01715M	Mouse	EIA,IHC,WB	Purified	IgG2a
Rotavirus NCDV (all antigens)	PAb	B65213G	Goat	ICC	HRP	–
Rotavirus NCDV (all antigens)	PAb	B65110G	Goat	IFA	Purified	–
Rotavirus NCDV (all antigens)	PAb	B65211G	Goat	IFA	Biotin	–
Rotavirus NCDV (all antigens)	PAb	B65212G	Goat	IFA	FITC	–
Rotavirus Group Specific Antigen	MAb	C86310M	Mouse	EIA,WB	Purified	IgG2a

Respiratory Syncytial Virus (RSV)

RSV is the most common cause of bronchiolitis (inflammation of the small airways in the lung) and pneumonia in children younger than 1 year of age in the United States. Several different types of laboratory tests are available for the diagnosis of an RSV infection including ELISA, rapid lateral flow, Direct Fluorescent Antibody Detection (DFA), neutralization assay and RT-PCR. Most clinical laboratories currently utilize EIA antigen detection tests, and many supplement antigen testing with cell culture or immunofluorescence assays to confirm diagnosis.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Respiratory Syncytial Virus (RSV) Antigen (strain Long) >10% Viral Protein	Ag	8175	FRhK Cells	EIA	Partially Purified	–
Respiratory Syncytial Virus (RSV) Long strain	Ag	R29124	Vero Cells	EIA	Purified	–
Respiratory Syncytial Virus (RSV) Long strain	Ag	R86900	MA104 Cells	EIA	Purified	–
Respiratory Syncytial Virus (RSV) Fusion Protein	MAb	C01769M	Mouse	EIA	Purified	IgG2b
Respiratory Syncytial Virus (RSV) Fusion Protein	MAb	C01777M	Mouse	EIA	Purified	IgG2a
Respiratory Syncytial Virus (RSV) Fusion Protein	MAb	C01772M	Mouse	EIA	Purified	IgG1
Respiratory Syncytial Virus (RSV) Fusion Protein	MAb	C01770M	Mouse	EIA	Purified	IgG2a
Respiratory Syncytial Virus (RSV) Fusion Protein	MAb	C01771M	Mouse	EIA	Purified	IgG2a
Respiratory Syncytial Virus (RSV) Fusion Protein	MAb	C01773M	Mouse	EIA,Pr	Purified	IgG1
Respiratory Syncytial Virus (RSV) Fusion Protein	MAb	C01774M	Mouse	EIA	Purified	IgG2a
Respiratory Syncytial Virus (RSV) Fusion Protein	MAb	C01775M	Mouse	EIA,Pr	Purified	IgG2a
Respiratory Syncytial Virus (RSV) Fusion Protein	MAb	C01776M	Mouse	EIA	Purified	IgG1
Respiratory Syncytial Virus (RSV) Fusion Protein	MAb	C65063M	Mouse	EIA,IFA,Pr	Purified	IgG2a
Respiratory Syncytial Virus (RSV) Fusion Protein	MAb	C65064M	Mouse	EIA,IFA,Neut,Pr	Purified	IgG1
Respiratory Syncytial Virus (RSV) Fusion Protein	MAb	C65065M	Mouse	EIA,IFA,Neut,Pr	Purified	IgG2a
Respiratory Syncytial Virus (RSV) Fusion Protein	MAb	C65816M	Mouse	EIA,IFA	Purified	IgG2b
Respiratory Syncytial Virus (RSV) Fusion Protein	MAb	C87610M	Mouse	IFA	Purified	IgG2b
Respiratory Syncytial Virus (RSV) Fusion Protein, Type A and B strains	MAb	C01626M	Mouse	EIA,FC,IFA,WB	Purified	IgG2a,k
Respiratory Syncytial Virus (RSV) Long strain	MAb	C01694M	Mouse	EIA,LF	Purified	IgG2b
Respiratory Syncytial Virus (RSV) Long strain	MAb	C86001M	Mouse	EIA,LF	Purified	IgG1
Respiratory Syncytial Virus (RSV) Nucleoprotein	MAb	C65067F	Mouse	EIA,IFA	FITC	IgG2a

Product List *continued*

Respiratory Syncytial Virus (RSV) continued

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Respiratory Syncytial Virus (RSV) Nucleoprotein	MAb	C65067M	Mouse	EIA,IFA	Purified	IgG2a
Respiratory Syncytial Virus (RSV) Nucleoprotein	MAb	C66432M	Mouse	DB,LF	Purified	IgG
Respiratory Syncytial Virus (RSV) Nucleoprotein	MAb	C87320M	Mouse	EIA,IHC(f)	Purified	IgG1
Respiratory Syncytial Virus (RSV)	PAb	B65820G	Goat	EIA,IFA,IHC(p), Neut	Biotin	–
Respiratory Syncytial Virus (RSV)	PAb	B65830G	Goat	EIA,FC,IHC(p),WB	FITC	–
Respiratory Syncytial Virus (RSV)	PAb	B65840G	Goat	EIA,ICC,IHC(p), Neut,WB	HRP	–
Respiratory Syncytial Virus (RSV)	PAb	B65860G	Goat	EIA,IFA,IHC(p)	Purified	–

Rubella

Also known as German Measles, Rubella is a viral illness that primarily affects the skin and lymph nodes. The primary medical danger of rubella is the infection of pregnant women because it can cause congenital rubella syndrome (CRS) in developing babies. A woman infected with rubella in the first trimester has an 90% chance of having a baby with CRS.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Rubella Grade III Antigen (strain HPV77) >60% Viral Protein	Ag	6075	Vero Cells	EIA,WB	Purified	–
Rubella Grade IV Antigen (strain HPV77) >90% Viral Protein	Ag	6076	HF Cells	EIA,WB,CLIA	Purified	–
Rubella Grade IV Antigen (strain HPV77) >90% Viral Protein, PBS	Ag	6123	HF Cells	EIA,WB,CLIA	Purified	–
Rubella RSVP(TM) (strain HPV77) >90% Viral Protein, Capsid-Free	Ag	6200	Vero Cells	EIA,WB	Purified	–
Rubella Capsid (C) Recombinant	Ag	R18092	*E. coli*	EIA,WB	Purified	–
Rubella Virus E1 Mosaic, Recombinant	Ag	R01491	*E. coli*	EIA,WB	Purified	–
Rubella Virus E1 Mosaic, Recombinant	Ag	R18192	*E. coli*	EIA,WB	Purified	–
Rubella Virus E2 Protein, Recombinant	Ag	R18292	*E. coli*	EIA,WB	Purified	–
Rubella (E1)	MAb	C66499M	Mouse	EIA,WB	Purified	IgG2a,k
Rubella (E1)	MAb	C66503M	Mouse	EIA,WB	Purified	IgG2a
Rubella (E1)	MAb	C86323M	Mouse	EIA,WB	Purified	IgG2a
Rubella 2-6	Mab	EV9525	Mouse	EIA	Purified	–
Rubella 2-42	Mab	EV9526	Mouse	EIA	Purified	–
Rubella Capsid (C) Protein	MAb	C66496M	Mouse	EIA,IFA,WB	Purified	IgG1,k
Rubella (virions)	PAb	B65105G	Goat	IFA, HI	Purified	–
Rubella (virions)	PAb	B65703F	Goat	IFA	FITC	–
Rubella (virions)	PAb	B65704P	Goat	ICC	HRP	–

Rubeola (Measles)

Rubeola is a highly contagious viral infection of the respiratory system, immune system, and skin. Complication with measles is common and can be fatal. It is a leading cause of vaccine-preventable childhood mortality.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Rubeola (measles) Antigen (strain Edmonston) (Nucleocapsid)	Ag	7604	Vero Cells	EIA, CLIA	Partially Purified	–
Rubeola (measles) Virus Nucleoprotein, Recombinant	Ag	EV9298	Sf9 Insect Cells	EIA,WB,CLIA	Purified	–
Rubeola (measles) Antigen (strain Edmonston)	Ag	R14120	Vero Cells	EIA, CLIA	Partially Purified	–
Measles Virus (Rubeola)	MAb	C01723M	Mouse	EIA,IFA	Purified	IgG
Measles Virus (Rubeola)	MAb	C01724M	Mouse	EIA,IFA	Purified	IgG
Measles Virus (Rubeola)	MAb	C01725M	Mouse	EIA,IFA	Purified	IgG
Measles Virus (Rubeola)	MAb	C01726M	Mouse	EIA,IFA	Purified	IgG

Toxoplasma gondii

A protozoan parasite that causes the disease toxoplasmosis. If a mother becomes infected while pregnant, the parasite can spread to a developing fetus to cause congenital toxoplasmosis. The overall risk of congenital infection from acute *T. gondii* infection during pregnancy ranges from approximately 20 – 50%.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Toxoplasma gondii Native Antigen	Ag	8200	Vero Cells	EIA, WB	Purified	–
Toxoplasma gondii p29 (GRA7) Recombinant	Ag	R18306	*E. coli*	EIA,WB	Purified	–
Toxoplasma gondii p30 (SAG1) Recombinant	Ag	R18426	*E. coli*	EIA,WB	Purified	–
Toxoplasma gondii p30 (SAG1) Recombinant	Ag	R01573	*E. coli*	EIA,WB	Purified	–
Toxoplasma gondii p35 (GRA8) Recombinant	Ag	R01581	*E. coli*	EIA,WB	Purified	–
Toxoplasma gondii (RH Strain) Concentrated	Ag	8158	Vero Cells	EIA, WB	Purified	–
Toxoplasma gondii	Ag	8159	Vero Cells	EIA, WB	Purified	–
Toxoplasma gondii	MAb	C65620M	Mouse	EIA,IFA,WB	Purified	IgG2
Toxoplasma gondii	MAb	C86319M	Mouse	EIA,IFA,WB	Purified	IgG2a
Toxoplasma gondii, SAG1	MAb	C01523M	Mouse	EIA,IFA,WB	Purified	IgG2a
Toxoplasma gondii MIC3	MAb	C01587M	Mouse	EIA,IFA,WB	Purified	IgG1
Toxoplasma gondii (38kDa protein)	MAb	C01589M	Mouse	EIA,IFA,WB	Purified	IgG1
Toxoplasma gondii (tachyzoites)	PAb	B01438R	Rabbit	EIA,IFA	Purified	–

Varicella-Zoster Virus (VZV)

VZV is one of eight herpes viruses and commonly causes chickenpox in children, teens and young adults and herpes zoster (shingles) in adults. It is usually a mild disease that lasts a short time in healthy children. However, it can be severe in adults and may cause serious and even fatal complications in people of any age.

Specificity	Type	Catalog #	Host / Source	Tested Apps	Format	Isotype
Varicella-Zoster Virus (VZV) Antigen (Ellen strain) >10% Viral Protein	Ag	7209	HF Cells	EIA	Partially Purified	–
Varicella-Zoster Virus (VZV) Antigen (Ellen strain) Detergent-Free	Ag	7740	HF Cells	EIA	Partially Purified	–
Varicella-Zoster Virus (VZV) Antigen (Ellen strain) PBS	Ag	7201	Vero Cells	EIA	Partially Purified	–
Varicella-Zoster Virus (VZV) Antigen (Ellen strain) glycoprotein	Ag	R14041	Human Embryo Lung Cell Culture	ELISA	Purified	–
Varicella-Zoster Virus (VZV) gE Antigen (Ellen strain) Recombinant	Ag	R18330	*E. coli*	EIA,WB	Purified	–
Varicella-Zoster Virus (Mixed)	MAb	C05108MA	Mouse	IFA,IHC(p), IP,WB, EIA	Purified	Mixed
Varicella-Zoster Virus (VZV) (GpI & IV) (VZVgE & gI)	MAb	C05100MA	Mouse	EIA,IFA,IP,WB	Purified	IgG2b,k
Varicella-Zoster Virus (VZV) (GpI & IV) (VZVgE & gI)	MAb	C05101MA	Mouse	EIA, IFA, IP, WB	Purified	IgG1
Varicella-Zoster Virus (VZV) (gpII) (VZVgB)	MAb	C05102MA	Mouse	IFA, IHC, IP, WB	Purified	IgG1
Varicella-Zoster Virus (VZV) (gpIV) (VZVgB)	MAb	C05105MA	Mouse	IFA, IP, WB	Purified	IgG1
Varicella-Zoster Virus (VZV) (gpIII) (VZVgH)	MAb	C05104MA	Mouse	IFA, IP, WB	Purified	IgG1
Varicella-Zoster Virus (VZV) 175kDa, gene 62	MAb	C05107MA	Mouse	IFA, IHC, IP	Purified	IgG1

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