

Product Information

Name of Kit: Mouse ImmunoComb® Antibody Test Kit

Catalog No: 50MIC103 / 50MIC130

No of Tests: 120 / 1200

Intended Use: The Mouse ImmunoComb® Antibody Test Kit is intended to assist with health serosurveillance program. Lab subjects (rodents) need to be Specific-Pathogen-Free (SPF) in order to prevent faulty research results. Thus this serological assay allows routinely monitoring for viral adventitious infections.

The agents that are being tested for:

- MHV - Mouse Hepatitis Virus
- MPV - Mouse Parvovirus (strains 1 and 2)
- MVM - Minute Virus of Mouse
- MNV - Murine Norovirus

Importance and Advantages of Serosurveillance: Even in the absence of disease, adventitious (i.e. accidental) viral infections of Specific-Pathogen-Free (SPF) laboratory animals have been shown to interfere with research by distorting the biological responses that depended on infected host cells and by contaminating biologic reagents and products. Serology is the principal diagnostic methodology by which SPF rodents are routinely monitored, for adventitious viral infections. The reasons for this are that serologic immunoassays are comparatively inexpensive and simple to perform; they are accurate because seroconversion occurs soon after infection and serum antibodies often persist for life. Serology is efficient since a single specimen of serum can be tested for antibodies to a panel of viruses.

Diagnostic Method: The ImmunoComb® test is based on solid phase “dot”-ELISA technology. Antigens are applied to test ‘spots’ on the solid phase, which is a comb-shaped plastic card. The Comb has 12 teeth - sufficient for 12 samples.

The samples to be tested are mixed with diluent in the first row of wells of a multi-chamber developing plate. The test spots on the Comb are then

incubated with the sample in the developing plate. Specific IgG antibodies from the samples, if present, bind to the antigens at the test spots.

The Comb is then transferred to a well, where unbound antibodies are washed from the antigens spots. In the next step, the Comb is allowed to react with an anti-mouse IgG Alkaline Phosphates conjugate, which will bind to antigen-antibody complexes at the test spots. After another wash, the Comb is moved to a well, where a color result develops via an enzymatic reaction. The intensity of the color result of test spots corresponds directly to the antibody level in the test sample.

MHV	Specificity: 100%	Sensitivity: 100%
MPV	Specificity: 100%	Sensitivity: 100%
MVM	Specificity: 100%	Sensitivity: 100%
MNV	Specificity: 100%	Sensitivity: 100%

Review of Diseases:

Mouse Hepatitis Virus

MHV is the most important infectious agent of mice, which are used as research subjects. More complications of research are known for MHV than any other agent. MHV is extremely contagious. Although the infection generally causes no overt clinical signs, it can cause profound changes in the immune system, affecting the interpretation of a wide variety of experimental results.

Agent: MHV is actually not a single virus, but a large group of ssRNA viruses, Coronavirus. About 25 serologically and genetically related strains are included under this term. The natural and sole host is the mouse. MHV is extremely contagious and of all mouse infectious agents is probably the most difficult agent to control.

Transmission: Transmission occurs by several routes, including contact, aerosol, fomites, and airborne particles of feces, bedding, etc. MHV is a frequent contaminant of transplantable tumors and cell lines.

Clinical signs: In immunocompetent mice, MHV infections are usually asymptomatic. Clinical infection occurs when the virus is introduced into a naive colony. According to their primary site of replication, the many strains of MHV are divided between the overlapping respiratory and enterotropic biotypes.

Mouse Parvovirus and Minute Virus of Mouse

Agents: MPV and MVM belong to the Parvovirus genus of the Parvoviridae family. As such, they are tiny, non-enveloped DNA viruses (measuring just 15-28 nm in diameter) that need mitotically active host cells to replicate.

Because of their physiochemical properties, parvoviruses have been difficult to exclude and eliminate from facilities.

Their predilection for dividing cells substantially accounts for the pathogenicity and research complications they cause. MVM has been reported as a common contaminant of transplantable tumors and mouse leukemia virus stocks.

Transmission: The parvoviruses require rapidly dividing cells (such as GI, skin, and lymphoid organs) to survive. They are shed in urine and feces and may be transmitted via respiratory routes. They are highly contagious and shedding of virus occurs for an undetermined time after infection. Direct contact with affected animals is probably required, but transmission has not been well characterized.

Clinical signs: Both MVM and MPV target small intestine and lymphoid tissues in susceptible mice, and MVM also replicates preferentially in the kidney. Natural infections are predominantly asymptomatic

Murine Norovirus

According to serologic and PCR surveys, the prevalence of MNV in research mice is between 20% and 30%, far exceeding the prevalence of other longer known rodent viruses. In addition to its recent discovery, the high prevalence of MNV can be attributed to infections being predominantly silent, with chronic shedding of environmentally stable, non-enveloped virus particles.

Agent: MNV is the newest member of the Norovirus genus of the Caliciviridae family, which comprises small (i.e., 28-35 nm in diameter) non-enveloped RNA viruses. Many strains of MNV have been recognized. Most have been found to persistently infect mice, with prolonged fecal shedding occurring even in immunocompetent hosts.

Transmission: The exact mode of transmission is not completely understood with the murine norovirus. If deduced from other Caliciviridae family members, the main mode of transmission would be either through aerosol or feco-oral routes.

Clinical signs: MNV infections of mice appear to be largely asymptomatic, except in mice lacking innate immunity, which have been reported to succumb to infection, with encephalitis, hepatitis and pneumonia.

Diagnosis: The Mouse ImmunoComb® Kit is a rapid, sensitive and convenient modification of the indirect ELISA for demonstrating seroconversion by mice to mouse hepatitis virus (MHV), mouse parvovirus (MPV), mouse minute virus (MVM) and murine norovirus (MNV). While improved biosecurity practices and the utilization of sensitive serologic and polymerase chain reaction (PCR) assays have eliminated many once common adventitious agents such as Sendai virus from mouse colonies,

MHV, MPV, MVM and MNV are still prevalent because they are highly contagious, environmentally stable and prevalent contaminants of animal-derived biologics.

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