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Human Cytomegalovirus Nucleic Acid Detection Kit (Fluorescent PCR Method)

Product Number: DTK323

Shipping and Storage

-20℃± 5℃, stored in the dark, transported, and subjected to repeated freeze-thaw cycles no more than 5 times, with a validity period of 12 months.

Component

Component	50T
HCMV reaction solution	500μL×2
Enzyme solution	50μL
HCMV positive quality control samples	250μL
Negative quality control product	250μL

Note: Different batches of reagents cannot be mixed.

Description

This kit is designed with specific primers and probes based on the HCMV virus gene, and uses fluorescence PCR technology to amplify and detect the nucleic acid of HCMV virus in vitro, for the pathogen diagnosis of suspected infectious materials in clinical practice.

Application

Cytomegalovirus infection is widely prevalent. Typically, many normal individuals have latent cytomegalovirus, but in most immunocompetent individuals, it presents as asymptomatic infection. Human cytomegalovirus (HCMV) infection is more common in fetuses, newborns, pregnant women, and immunocompromised individuals. After infection in pregnant women, it can cause fetal intrauterine infection or perinatal infection, leading to fetal malformation, intellectual disability, or developmental laxity. In severe cases, it can cause systemic infection syndrome. When the body is immune deficient or the immune system is in a suppressed state, such as in patients with tumors, organ transplants, or acquired immunodeficiency syndrome, reactivation of primary or latent HCMV infection often causes multiple opportunistic infections and can lead to death. This kit is used for in vitro detection of human cytomegalovirus nucleic acid in human serum or urine samples.

This kit is suitable for detecting human cytomegalovirus nucleic acid in human serum or urine samples, and can be used for auxiliary diagnosis of human cytomegalovirus infection and monitoring the efficacy of antiviral drug treatment. The test results are for reference only and cannot be used alone as a basis for confirming or excluding cases.

Applicable instruments

ABI7500, Agilent MX3000P/3005P, LightCycler, Bio Rad, Eppendorf and other series of fluorescence quantitative PCR detectors.

Specimen collection

This kit is suitable for serum or urine samples. When collecting serum samples, take venous blood from the subject being tested. Extract 2mL using a sterile injection needle and collect it in a sterile centrifuge tube. Leave it at room temperature for no more than 4 hours, centrifuge at 1500 rpm for 5 minutes, and transfer the serum (do not inhale red blood cells) to another sterile centrifuge tube for later use; When collecting urine samples, mix approximately 10mL of the first segment of morning urine with urine preservation solution, seal and send for testing.

The collected or processed samples should be stored at 2℃~8℃ for no more than 24 hours; if long-term storage is required, they should be stored at -70℃ or below, with no more than 3 freeze-thaw cycles.

Protocol

1. Sample processing (sample processing area)

1.1. Sample Preparation

Urine sample: Take 5-10mL of urine sample into a 15mL centrifuge tube and centrifuge at 12000 rpm for 5 minutes; Remove the supernatant, add 500μL of physiological saline to the precipitate, and mix well. Take 200μL. Directly add 200μL of serum for extraction.

1.2. Nucleic acid extraction

We recommend using our nucleic acid extraction or purification reagents (magnetic bead method or centrifugal column method) for nucleic acid extraction. Please follow the instructions in the reagent manual.

2. Reagent preparation (reagent preparation area)

Based on the total number of samples to be tested, the required number of PCR reaction tubes is N (N=number of samples+1 negative control tube+1 positive control tube); For every 10 samples, an additional 1 sample is prepared. The preparation of each test reaction system is shown in the following table:

reagent	HCMV Reaction solution	Enzyme solution
Dosage (sample size N)	19μL	1μL

Transfer the mixed test reaction solution into a PCR reaction tube at a concentration of 20μL per tube.

3. Sample addition (sample processing area)

Take 5μL of the nucleic acid, positive control sample, and negative control sample extracted in step 1, and add them to the corresponding reaction tubes. Cover the tubes, mix well, and briefly centrifuge.

4. PCR amplification (nucleic acid amplification zone)

4.1. Place the reaction tube to be tested in the reaction tank of the fluorescence quantitative PCR instrument;

4.2. Set the channel and sample information, and set the reaction system to 25μL;

Fluorescence channel selection: Detection channels (Reporter Dye) FAM, CY5, Quencher Dye NONE, please do not select ROX reference fluorescence for ABI series instruments, select None.

4.3. Recommended loop parameter settings:

step	Cycles	Temperature	Time	Collect fluorescence signals
1	1 cycle	95℃	2min	No
2	45 cycles	95℃	15sec	No
		60℃	30sec	Yes

5. Result analysis and judgment

5.1. Result Analysis Condition Setting

(Please refer to the user manuals of each instrument for setting up, taking the ABI7500 instrument as an example)

After the reaction is complete, the results will be automatically saved. Based on the analyzed image, adjust the Start value, End value, and Threshold value of the baseline (users can adjust them according to their actual situation, with Start value set between 3-15 and End value set between 5-20, so that the threshold line is in the exponential period of the amplification curve, and the amplification curve of negative quality control products is flat or below the threshold line). Click Analyze to automatically obtain the analysis results.

5.2. Result judgment

Positive: The Ct value of the detection channel is ≤ 40, and the curve shows a significant exponential growth curve;

Negative: The sample test result shows no Ct value and no specific amplification curve.

Suspicious: If the sample test result is 40<Ct value ≤ 45, it is recommended to repeat the test. If the detection channel is still 40<Ct value ≤ 45 and the curve has a clear exponential growth curve, it is judged as positive. Otherwise, it is judged as negative.

Quality control standards

Negative quality control product: no specific amplification curve or Ct value display;

Positive quality control product: The amplification curve shows a significant exponential growth period, and the Ct value is ≤ 32;

The above conditions should be met simultaneously, otherwise the experiment will be considered invalid.

Limitations of detection methods

1. The results of sample testing are related to the quality of sample collection, processing, transportation, and preservation;
2. Failure to control cross contamination during sample extraction can result in false positive results;
3. Leakage of positive controls and amplification products can lead to false positive results;
4. During the epidemic, genetic mutations and recombination of pathogens can lead to false negative results;
5. Different extraction methods have differences in extraction efficiency, which can lead to false negative results;
6. Improper transportation, storage, or inaccurate preparation of reagents can lead to a decrease in reagent detection efficiency, resulting in false negatives or inaccurate quantitative testing results;
7. The test results are for reference only. If a diagnosis is required, please combine clinical symptoms and other testing methods.

Note

1. All operations must be strictly carried out in accordance with the instructions;
2. The various components in the reagent kit should be naturally melted, completely mixed, and briefly centrifuged before use;
3. The reaction solution should be stored away from light;
4. Try to avoid the presence of bubbles during the reaction, and cover the tube tightly;
5. Use disposable suction tips, disposable gloves, and specialized work clothes for each area;
6. Sample processing, reagent preparation, and sample addition should be carried out in different areas to avoid cross contamination;
7. After the experiment is completed, treat the workbench and pipette with 10% hypochlorous acid, 75% alcohol, or a UV lamp;
8. All items in the reagent kit should be treated as contaminants and handled in accordance with the "Biosafety Guidelines for Microbial Biomedical Laboratories".