

Diagnostic Kit for Hanta Virus RNA

Product Number: DTL0328

Shipping and Storage

1. Store below 30°C. It is valid for 12 months.
2. Transport at normal temperature, not suggested over 14 days.
3. Opened but not completely used the all components should be stored at (-20±5)°C. It is recommended to separate in PCR tubes before refrigeration to avoid repeated freezing and thawing of all reagents next time. It is not recommended to repeat the freeze-thaw cycle more than 7 times.
4. Date of manufacture and term of validity: see the label.

Component

Component	48T
HV RT-PCR Master Mix	Lyophilized powder ×1 Bottle
Positive Control	100µL
Negative Control	1mL
Redissolved Diluent	1.5mL

1. Do not mix reagents from different batches.
2. The reaction system is lyophilized powder that contains all components required for fluorescence PCR, including Taq enzyme, reverse transcriptase, primers, probes, dNTPs, and Mg²⁺.

Description

This kit employs the TaqMan probe-based real-time fluorescent PCR technique. Specific primers and corresponding probes targeting HFRS-causing hantavirus are designed to amplify and detect hantavirus RNA in vitro using fluorescent PCR, enabling qualitative detection of HFRS hantavirus in specimens. The kit is provided with an Internal Control (IC), which can monitor whether there is PCR inhibitor in the sample to be tested by detecting whether the internal control is normal or not, so as to avoid false negative PCR.

Application

Hantavirus belongs to the genus Hantavirus, family Hantaviridae, order Bunyvirales. It is a group of enveloped, segmented RNA viruses carried by rodents, which can cause damage to human kidneys or lung tissues.

Based on the clinical symptoms following infection, hantaviruses are classified into two categories: one causing hemorrhagic fever with renal syndrome (HFRS), and the other causing hantavirus pulmonary syndrome (HPS). The main clinical manifestations of hemorrhagic fever with renal syndrome include high fever, chills, fatigue, generalized myalgia, and petechiae or ecchymoses on the skin and mucous membranes; in severe cases, the kidneys may be endangered.

More than 40 hantavirus species have been identified to date, among which at least 22 are pathogenic to humans. Major pathogens responsible for hemorrhagic fever with renal syndrome include Hantaan virus (HTNV), Seoul virus (SEOV), Puumala virus (PUUV), and Dobrava virus (DOBV).

This kit is intended for the detection of hemorrhagic fever with renal syndrome (HFRS)-causing hantavirus in whole blood samples. It is suitable for the auxiliary diagnosis of HFRS hantavirus infection and epidemiological investigations.

Applicable instruments

Real-time fluorescence PCR instrument with FAM, VIC channels.

Specimen collection

For Research Use Only

1. Applicable sample type: whole blood sample.
2. Sample collection: Collect 3mL to 5mL of venous blood from the patient into an anticoagulant tube and label properly. Whole blood samples can be used directly for nucleic acid extraction.
3. Sample storage and transportation: The collection or processing sample should not exceed 24 hours under the conditions of 2°C ~ 8°C. If long-term preservation is needed, it should be stored below -70°C, and the freezing fusion should not exceed 3 times.

Protocol

1. Reagent preparation:

Take out the HV RT-PCR Master Mix, open each bottle cap according to the arrow direction of the aluminum-plastic cover, add 960µL of Redissolved Diluent, strongly mixed on the vortex for more than 1 minute, then stand for 30 ~ 60 seconds until the liquid is clear and transparent. Subpackage it into PCR reaction tubes according to 20µL/ tube.

2. Nucleic acid extraction:

This kit is not included for Nucleic Acid(NA) extraction reagent.

Commercially available extraction kits that have been shown to generate highly purified RNA when following manufacturer's recommended procedures for sample extraction are applicable.

If the extracted RNA is not used immediately, it should be stored below -20°C. For long-term storage, it should be stored below -80°C and avoid repeated freezing and thawing.

Note: The Negative Control and the Positive Control does not require nucleic acid extraction.

3. Add sample:

The correspond substances were added to that above PCR reaction tubes according to the following table:

Type	Add sample description
Testing Sample	Add 5µL of the extract prepared in step 2 to the reaction tube, and close the tube cover.
Negative Control/ Positive Control	Add 5µL of negative control and positive control to the reaction tube, and cover the tube tightly.

The total reaction volume is 25µL.

After adding the sample, the PCR reaction tubes should be mixed well and centrifuged for 5s on a palm centrifuge and then delivery to the nucleic acid amplification region. If bubbles are found, the tube wall should be gently flicked to remove bubbles and centrifuged again.

4. RT-PCR amplification:

Place the reaction tube in the automatic fluorescent PCR instrument, set the negative control, positive control, and test sample parameters to perform RT-PCR experiment according to the operating instructions of the instrument, and record the corresponding sample name.

Select FAM channel to detect Hantavirus nucleic acid, select VIC channel to detect Internal Control. Set the sample reaction system to 25µL.

(Note: For ABI series instruments, select 'None' under 'Quencher', and select 'None' as the dye to use as the passive reference.)

Recommended reaction program setting:

Step	Cycles	Temperature	Time	Collect fluorescence signal
1	1 cycle	50°C	10min	No
2	1 cycle	95°C	2min	No
3	40 cycles	95°C	15sec	No
		60°C	30sec	Yes

5. Result analysis:

After the reaction is completed, the results are automatically saved.

The Start value, End value and Threshold value of the Baseline should be adjusted according to the analyzed image (the user can adjust it according to the actual situation, the Start value can be set at 3~15, the End value can be set at 5~20, the amplification curve of the negative control should be adjusted to be flat or below the threshold line).

Click Analyze for analysis, make the parameters meet the requirements in the following '6.Quality control', and then go to the Plate window to record the Ct value.

6. Quality control

Negative Control: FAM and VIC detection channel has no obvious amplification curve.

Positive Control: FAM and VIC detection channel all has an obvious amplification curve, and the Ct value ≤ 35.00 .

The above requirements must be met at the same time in the same experiment, otherwise this experiment is invalid and needs to be repeated.

Explanation of Test Result

1. Positive: If the Ct value of the detection channel is ≤ 40.00 , and the curve has an obvious exponential growth curve, then the virus type corresponding to the channel is positive, and there is no IC requirement.
2. Negative: If the Ct value of the sample test result is >40.00 or there is no Ct value, and the Ct value of the IC is ≤ 40.00 , then the virus type corresponding to the channel is negative.
3. If the amplification curve of the FAM channel of the test sample does not have a logarithmic growth phase, and the Ct value of the VIC channel is >40.00 , the test result of the sample is invalid, and the cause should be found and eliminated. Collect samples again and repeat the experiment.

Limitation

1. Sample detection results are related to sample collection, processing, transportation and preservation quality.
2. If cross-contamination is not controlled during the sample extraction process, false positive results will occur.
3. Positive control and leakage of amplification products can lead to false positive results.
4. The genetic mutations and reorganizations during epidemics can lead to false negative results.
5. Different extraction methods have differences in extraction efficiency, which will lead to false negative results.
6. Reagent transportation, improper preservation, or inaccurate reagent preparation reagent detection performance decreases, and the results of false negative or quantitative detection occur.
7. The results of this test are for reference only. If the diagnosis must be confirmed, please combine clinical symptoms and other test methods.

Performance Parameters

1. Limit of Detection: The minimum detection limit of this reagent is 500 copies/mL.
2. Precision: Repeat detection of the enterprise precision reference product 10 times, and the coefficient of variation (CV, %) of the Ct value of the pathogen detection channel is $\leq 5.00\%$.
3. Compliance rate of negative/positive reference products: The compliance rate of negative reference products in enterprise reference is 100%, and the compliance rate of positive reference products is 100%.

Note

1. Please read the instructions of this kit carefully before the experiment, and strictly follow the operation steps.
2. Before the test, please be familiar with and master the operation method and precautions of various instruments to be used, and carry out quality control for each experiment.
3. The reaction solution should be stored away from light.
4. Try to avoid bubbles in the reaction, and the tube cover needs to be tight.
5. Use disposable heads, disposable gloves and special work clothes in each district.
6. Sample processing, reagent preparation, and samples need to be performed in different areas to avoid cross -pollution.
7. After the experiment is completed, use 10% hypochloride or 75% alcohol or ultraviolet light to treat the workbench and pipette.
8. All items in the kit should be treated as pollutants and processed in accordance with the "Biological Safety General of Microbiological Biomedical Laboratory".