

Hepatitis B Virus / Hepatitis C Virus / Human Immunodeficiency Virus Type 1 Nucleic Acid Detection Kit (Fluorescence Quantitative PCR)



Hepatitis B virus (HBV) is the pathogen that causes hepatitis B, belonging to the family Hepadnaviridae, characterized as a hepatotropic DNA virus. HBV is known to have at least 8 genotypes (A to H), with each genotype further classified into different subtypes, and recombination events can occur between genotypes.

Hepatitis C virus (HCV) is responsible for hepatitis C and is classified as a single-stranded positive-sense RNA virus within the family Flaviviridae, genus Hepacivirus. HCV is typically categorized into 6 genotypes (1 to 6).

Human Immunodeficiency Virus (HIV) is a retrovirus belonging to the family Retroviridae, genus Lentivirus, and is the causative agent of acquired immunodeficiency syndrome (AIDS). HIV is divided into HIV-1 and HIV-2 types.

Nucleic acid detection offers advantages such as high sensitivity, strong specificity, and short detection time. Real-time fluorescence polymerase chain reaction (PCR) utilizes gene sequences as targets for detecting viral nucleic acids (DNA or RNA) in serum, plasma, or whole blood, establishing an in vitro quantitative detection method.

The Bioer HBV/HCV/HIV-1 Nucleic Acid Detection Kit (Fluorescent Quantitative PCR) offers the following main parameters (based on testing results from 200 μ L whole blood samples).

Specification:

Specification	Description
Sample Type	Serum, plasma or whole blood
Genotype	HBV genotypes A, B, C, D, E, F, G, H; HCV genotypes 1, 2, 3, 4, 5, 6; HIV-1 group M
Limit of Detection	25 IU /mL(HBV), 50 IU /mL(HCV), 100 IU /mL(HIV-1)
Limit of Quantitation	50 IU /mL(HBV), 200 IU /mL(HCV), 400 IU /mL(HIV-1)
Linear Range:	50 \sim 1×10^9 IU/mL(HBV), 200 \sim 1×10^8 IU/mL(HCV), 400 \sim 1×10^8 IU/mL(HIV-1)
Specificity	No cross-reactivity with pathogens such as Hepatitis A virus, Treponema pallidum (the causative agent of syphilis), and other pathogens.
Compatible Platform	LineGene and QuantGene series of fluorescence quantitative PCR instrument, Thermofisher ABI 7500
Time	70 min
Storage Condition	-20 \pm 5°C away from light

Features:

- ✓ **Sample Compatibility:** Plasma, serum, whole blood. Sample volume required is only 200 μ L.
- ✓ **High Accuracy:** Capable of quantitatively detecting Hepatitis B Virus, Hepatitis C Virus, and Human Immunodeficiency Virus Type 1 content in samples with high precision, producing expected test results.
- ✓ **Excellent Specificity:** No cross-reactivity with pathogens such as Hepatitis A virus, Treponema pallidum (the causative agent of syphilis), and other pathogens.
- ✓ **Real-time Monitoring:** Introduction of exogenous internal controls to monitor the entire extraction and PCR detection process.
- ✓ **Simple Operation:** Pre-mixed reaction solution, requiring only minimal preparation before use to effectively prevent aerosol contamination.
- ✓ **Rapid:** Testing can be completed within 70 minutes.

Application:

Case 1:

Using this assay kit to detect Hepatitis B Virus, Hepatitis C Virus, and Human Immunodeficiency Virus Type 1, and constructing standard curves. The correlation coefficient (R^2) for the Ct values of target genes reached above 0.999, indicating excellent linearity and high PCR efficiency. The results are shown in the following figure:

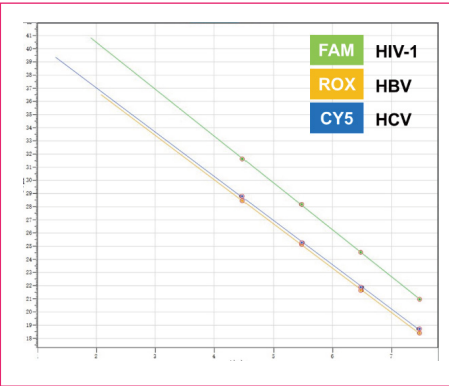


Figure 1: Standard Curve of the Nucleic Acid Detection Kit for Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and Human Immunodeficiency Virus Type 1 (HIV-1) using Fluorescent Quantitative PCR (qPCR) Method.

Case 2:

When tested using this assay kit, pathogens including Hepatitis B virus, Human Immunodeficiency Virus (HIV), Hepatitis C virus, Hepatitis A virus, Treponema pallidum (the causative agent of syphilis), Herpes simplex virus type 1, Herpes simplex virus type 2, Influenza A virus, and Staphylococcus aureus showed no amplification signal, indicating excellent specificity of the assay kit with respect to these pathogens.

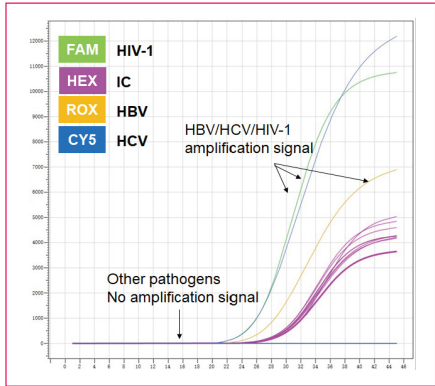


Figure 2: Amplification Curve of the Nucleic Acid Detection Kit for Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and Human Immunodeficiency Virus Type 1 (HIV-1) using Fluorescent Quantitative PCR (qPCR) Method

Case 3:

The assay kit was used to detect Hepatitis B virus WHO international standard (NIBSC code: 10/266), Hepatitis C virus WHO international standard (NIBSC code: 18/184), and Human Immunodeficiency Virus Type 1 WHO international standard (NIBSC code: 16/194). The logarithmic deviation between the quantitative values and theoretical values was ≤ 0.5 , indicating high accuracy of the assay kit's quantification. Results are shown in the following figure:

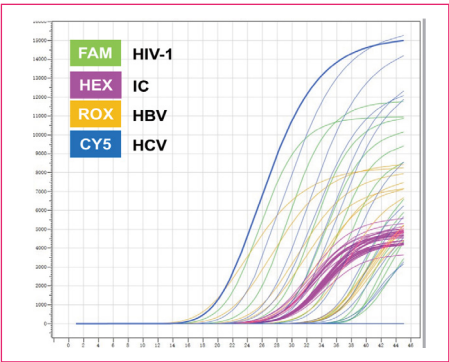


Figure 3: Amplification Curve of the Nucleic Acid Detection Kit for Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and Human Immunodeficiency Virus Type 1 (HIV-1)

HIV-1			HBV			HCV		
Theoretical Value IU/mL	Measured Value IU/mL	Logarithmic Deviation	Theoretical Value IU/mL	Measured Value IU/mL	Logarithmic Deviation	Theoretical Value IU/mL	Measured Value IU/mL	Logarithmic Deviation
1.00E+05	6.72E+04	0.17	1.00E+05	8.09E+04	0.09	1.00E+05	8.44E+04	0.07
1.00E+04	6.88E+03	0.16	1.00E+04	1.05E+04	0.02	1.00E+04	5.50E+03	0.26
1.00E+03	1.13E+03	0.05	1.00E+03	1.16E+03	0.07	1.00E+03	7.29E+02	0.14
4.00E+02	3.46E+02	0.06	5.00E+01	5.95E+01	0.08	2.00E+02	3.48E+02	0.24
1.00E+02	8.30E+01	0.08	2.50E+01	4.82E+01	0.28	5.00E+01	6.79E+01	0.13
Negative	/	/	/	/	/	/	/	/

Ordering Information:

Cat. No.	Product Name	Package
BSB110S1	Hepatitis B Virus / Hepatitis C Virus / Human Immunodeficiency Virus Type 1 Nucleic Acid Detection Kit (Fluorescence Quantitative PCR)	24T
BSB110M1		48T

For research use only



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