PG13 Residual DNA (qPCR) Detection Kit

Catalog Number：PG0311A-100

【Introduction to Kit】

PG13 residual DNA (qPCR) detection kit is a special kit for quantitative detection of PG13 host cell DNA residues in intermediates, semi-finished products and finished products of various biological products. This kit uses TaqMan fluorescence probe principle to quantitatively detect PG13 residual DNA in samples. The detection is fast, specific and reliable. The minimum detection limit can reach fg level.

【Product performance indicators】

Linear range: 300pg/μL ~ 0.003pg/μL.

Standard Linearity: $R^2 \geq 0.980$, amplification efficiency 90% ≤ Eff (%) ≤ 110%, with CV <15% for all concentration measurements.

Accuracy (Addition Recovery): 70%-130%.

Quantitative Limit: 0.003pg/μL, CV ≤ 20%, measurement deviation ≤ |±20%.

Precision (Repeatability): Perform 10 runs each at high and medium concentrations using reference materials, with CV <15%.

Negative Reference Agreement: NTC undetermined or Ct value>35.

Applicable Instruments (including but not limited to): ABI QuantStudio 5, ABI 7500, etc.

Freezing and thawing stability: more than 5 times.

【Components of the kit】

Table 1 Composition and storage conditions of the kit

Components	Total amount	Storage Conditions
PG13 Primer&Probe MIX	550 μL×1 tube	-20℃ (keep in dark)
2×qPCR Reaction MIX	1.6 mL×1 tube	-20℃
PG13 DNA Quantitative Reference (30 ng/μL)	50 μL×1 tube	-20℃
DNA diluent	1.5 mL×3 tubes	-20℃

【Specifications】

100 Reactions

【Period of validity】

Valid for 12 months under the prescribed storage conditions

【Self provided equipment required for test】

Fluorescence quantitative PCR instrument

1.5mL centrifuge tube with sterile, and low retention

Optical 8-tube strip or 96-well qPCR plate with sterile, DNase/RNase-free and low retention

1000 μL, 100 μL, 10 μL pipette gun

1000 μL, 100 μL, 10 μL pipette tip with sterile, low retention and filter element

【Applicable models (including but not limited to)】

ABI QuantStudio 3 Real-Time PCR System

LightCycler 480 Real-Time PCR System

ABI 7500 Real-Time PCR System

Bio-Rad CFX Opus96 Real-Time PCR System

Archimed™ X Real-Time PCR System

【Testing procedures】

- **Dilution of DNA quantitative reference**

Gradiently dilute PG13 DNA quantitative reference(30 ng/μL) with DNA diluent provided by the kit, and the dilution concentration is 3000 pg/μL, 300 pg/μL, 30 pg/μL, 3 pg/μL, 0.3 pg/μL, 0.03 pg/μL, 0.003 pg/μL. The specific steps are as follows:

1. The PG13 DNA quantitative reference and DNA diluent in the kit were melted on ice or at 2-8°C. After complete melting, slightly oscillate and mix well, quickly centrifuge for 3-5 s in a short time, and repeat 3 times.

2. Take seven clean 1.5 mL centrifuge tubes and mark them as ST0, ST1, ST2, ST3, ST4, ST5 and ST6 respectively.

3. Dilute PG13 DNA quantitative reference to 3000 pg/μL with DNA diluent in ST0 tube. The mixture was slightly oscillated, centrifuged for 3-5 s in a short time, and repeated three times to ensure that the DNA quantitative reference was fully mixed with the DNA diluent, and repeated freeze-thaw was avoided during use.

4. 90 μL DNA diluent was added to ST1, ST2, ST3, ST4, ST5 and ST6 tubes respectively, and then gradient dilution was performed. The dilution method is shown in Table 2 :

Table 2 Dilution of PG13 DNA quantitative reference

Dilution tube	Dilution volume	Final concentration (pg/μL)
ST1	10 μL ST0+90 μL DNA diluent	300

ST2	10 μL ST1+90 μL DNA diluent	30
ST3	10 μL ST2+90 μL DNA diluent	3
ST4	10 μL ST3+90 μL DNA diluent	0.3
ST5	10 μL ST4+90 μL DNA diluent	0.03
ST6	10 μL ST5+90 μL DNA diluent	0.003

Note :

1. The concentration points of the standard curve can be selected according to the actual verification results, and should contain at least 5 concentration points.

2. Melted and unused DNA diluent can be stored at 2-8°C for a short time. If it is not used for a long time, it should be stored at -20°C.

3. The dilution method can be adjusted according to the experimental needs.

- **Preparation and sample adding of qPCR reaction solution**

1. Calculate the number of holes required for reaction according to the number of standard samples and samples to be tested (generally 3 groups of multiple holes are made):

Number of reaction holes=(references ST1 to ST6+ NTC+sample to be tested)×3

2. Calculate the total amount of PG13 qPCR MIX required according to the number of reaction wells: PG13 qPCR MIX=(number of reaction wells+2 or 3) × 20 μL (2 or 3 is the operating loss)

3. Put all reagents on ice to melt, shake slightly and mix well, and prepare PG13 qPCR MIX as shown in Table 3.

Table 3 Preparation of PG13 qPCR Mix

Components	Single reaction amount
2×qPCR Reaction MIX	15 μL
PG13 Primer and Probe MIX	5 μL

4. Put the required reagent on ice to melt, shake slightly and mix well, and add samples as shown in Table 4 (total volume 30μL).

Table4 Sample adding examples of each reaction hole

Template	Template amount	PG13 qPCR MIX amount
Reference	10 μL of references ST1 to ST6	20 μL
Template-free NTC	10 μL of each DNA diluent	20 μL
Sample to be tested	10 μL of each sample to be tested	20 μL

5. The test can be performed by using optical 8-tube strip or 96-well qPCR plate. Bubbles in the reaction system should be removed and centrifuged to be bottom of the tube.

- **qPCR reaction procedure and parameter setting**

Take American ABI QuantStudio 3 Real-Time PCR System and software version 1.4.3 as an example.

1. Create a blank new program. Experiment type: Standard curve, Chemistry: TaqMan® Reagents, Run mode: Standard.

2. Create a new detection probe, named PG13-DNA, with FAM as the reporting fluorescence and None as the quenching fluorescence(ROX as the reference fluorescence) .

3. Set the reaction procedure

Stage1	Predenaturation	Reps:1	95℃	30 s
Stage2	Cyclic reaction	Reps:40	95 ℃	5 s
			56 ℃	34 s

Stage3 is set to fluorescence collection at 56 ℃ for 34 s.

4. Click the“Start Run”button in the Run interface to perform PCR measurement.

- **qPCR result analysis**

Take American ABI 7500 Real-Time PCR System and software version 2.06 as an example.

1. In the Plate interface, set the Task column of standard curve as “S”, and assign values to the Quantity column as 300,30,3,0.3,0.03 and 0.003 (pg/μL) , and name them ST1,ST2,ST3,ST4,ST5 and ST6 in the corresponding Sample name column.

2. In the Plate interface, set the Task column of NTC (no template comparison) as “N”, set the Task column of samples to be tested as “U”, and name the samples in the corresponding Sample name column.

3. Click Analyze, and in the Amplification Plot panel of Results, preliminarily check whether the shape of the amplification curve is normal.

4. In the Standard Curve panel of Results, you can read the Slope, R^2 and amplification efficiency (Eff%) of the standard curve.

5. In the View panel of Results, you can read the detection value of NTC and the samples to be tested in the column of Mean Quantity, pg/μL.

- The parameter setting of the analysis results depends on the specific model and the software version used, and it can also be automatically interpreted by the instrument.
- The test result of NTC should be undetermined or Ct value >35.

【Precautions】

1. This kit has passed the verification of stability (freeze-thaw and other factors), and does not need to be divided into multiple tubes.

2. The preparation environment of negative reagents and positive reagents should be divided into different areas, and cannot be operated in one area.

3. Pay attention to replacing the tips in time between different sampling steps to avoid cross contamination, and avoid opening the tube cover for a long time.

4. The kit must be used within the validity period. All components in the kit are recommended to be used after melting in a low temperature environment.

5. It is recommended that all components in the kit be used after melting in a low temperature environment, and ensure that they are fully dissolved. Each component should be fully mixed before use to ensure the uniformity of the reagent. The mixed reagent should be centrifuged for a short time to make all the liquid on the tube wall and lid concentrate at the bottom of the tube. If precipitates are found in the DNA diluent, it is recommended to incubate at 37 ° C to completely dissolve the DNA diluent..

6. Only by strictly observing the operating methods of the instructions and using all the reagents matched with this kit can the best detection effect be ensured.

7. The final test result is closely related to the effectiveness of the reagent, the operator's operation method and the test environment.

8. The company is only responsible for the kit itself, and is not responsible for the sample consumption caused by the use of the kit. Please fully consider the possible usage of samples and reserve enough samples before use.

9. This kit is only for in study, not for clinical diagnosis.

The specification is issued in version A/0 with an effective date of 21st Oct, 2024.