

EpiTech Taq DNA Polymerase

Cat. No.: FP1508958 | Pack size: 250 U / 1 KU / 5 KU | Storage: -20 °C

Product Description

This product uses the engineered hot-start EpiTech Taq DNA Polymerase, which has enhanced binding ability to DNA templates and significantly improved anti-interference capability. The enzyme retains the 5'→3' exonuclease activity of Taq enzyme and can be used for probe-based fluorescent quantitative PCR detection. Meanwhile, Taq monoclonal antibody is added to modify the original enzyme, enhancing the blocking effect on the active site of Taq enzyme and improving specificity. Before high-temperature heating, the Taq monoclonal antibody binds to Taq polymerase to inhibit its activity, thereby suppressing non-specific amplification caused by non-specific annealing of primers or primer dimers under low-temperature conditions. When the amplification reaction system is heated to 95 °C, the polymerase activity is restored due to the denaturation of Taq monoclonal antibody, so no special inactivation treatment is required, and it can be used under conventional PCR reaction conditions.

With an optimized buffer system, EpiTech Taq DNA Polymerase is suitable for PCR reactions of DNA samples treated with bisulfite conversion, and has better amplification efficiency and sensitivity for template DNA containing uracil after bisulfite conversion. Compared with ordinary DNA, DNA after bisulfite conversion is severely damaged, which will affect the performance of PCR reactions. Similarly, for amplifying damaged DNA samples, cytosine deamination occurs spontaneously over a long period of time, and the deamination rate accelerates when the temperature rises, leading to the accumulation of uracil in DNA and free nucleotides. When other correction enzymes are ineffective, EpiTech Taq DNA Polymerase can efficiently amplify such damaged DNA templates containing uracil.

Contents & Storage

Cat. No.	Component	250 U	1 KU	5 KU	Storage
FP1508958A	EpiTech Taq DNA Polymerase (5U/μL)	50 μL	200 μL	1 mL	-20 °C. Avoid freeze/thaw cycles.
FP1508958B	5×EpiTech Taq DNA Polymerase Buffer	1 mL	4 mL	20 mL	-20 °C. Avoid freeze/thaw cycles.

Product Information

Item	Details
Grade & Purity	Recombinant, suitable for molecular biology, EnzymoPure™, for DNA and RNA applications, 5 U/μL

Item	Details
Unit Definition	The activity is defined as 1 unit (U) when 10 nmol of total nucleotides are incorporated into acid-insoluble substances within 30 minutes at 74 °C, using activated chinook salmon sperm DNA as the template/primers.
Bioactivity	5 U/μL
Stability and Storage	Store at –20 °C long term. Upon receipt, it is recommended to aliquot. Avoid freeze/thaw cycles.
Storage	Store at –20 °C. Avoid repeated freezing and thawing.
Shipped In	Ice chest + ice pads.

Scope of Application

Suitable for PCR reactions of DNA samples treated with bisulfite conversion.

Precautions

In this experiment, the pretreatment process of bisulfite will directly affect the quality of template DNA; the treated template cannot be stored for a long time and should not be kept at –20 °C for more than one month.

Other Precautions

1. Excessive template DNA is prone to cause non-specific PCR products.
2. Recommendations for the use of templates: take mammalian and *E. coli* genomic DNA as examples:

Reagent Name	Addition Amount
Mammalian Genomic DNA	0.1–1 μg
<i>E. coli</i> Genomic DNA	10–100 ng

Usage Method

Preparation Before Reaction System Preparation:

1. Thaw and mix all solutions required for the reaction at room temperature or 4 °C. Then place them on an ice bath or in an ice box. It is recommended to aliquot the reaction solutions for use to avoid repeated freeze-thaw cycles.
2. Prepare the reaction system with reference to the following table. It is recommended to prepare the reaction system on an ice bath or in an ice box.

Component	Addition Volume per Reaction	Final Concentration
5×EpiTech Taq DNA Polymerase Buffer	10 μL	1×

Component	Addition Volume per Reaction	Final Concentration
EpiTech Taq DNA Polymerase	0.5 µL	0.05 U/µL
dNTPs	0.5 µL	0.25 mM
Primer-probe Mix ^a	X µL	—
Template	X µL	—
ddH ₂ O	To 50 µL	—
Final Volume	50 µL	

Note: a. The amounts of primers, probes, and templates can be adjusted according to actual needs.

3. Gently pipette to mix or vortex slightly, then centrifuge at room temperature for a few seconds to collect the liquid at the bottom of the tube.
4. Place each prepared PCR reaction tube in a PCR instrument and start the PCR reaction.

Reaction Procedure

Fluorescent Quantitative PCR

Step Name	Temperature	Time	Cycles
Pre-denaturation	95 °C	10 min	1
Denaturation ^a	94 °C	15 s	40–45
Annealing + Extension ^a	60 °C	40 s (Collect Fluorescence)	40–45

a. Reaction conditions can be adjusted according to the primers, probes, and templates.

Experimental Example

In this experiment, the colorectal cancer-related genes SDC2 and TFPI2 were used as target genes for detection, and ACTB was used as an internal reference gene. The detection results are shown in Figure 1 (template concentration: 10 ng/µL).

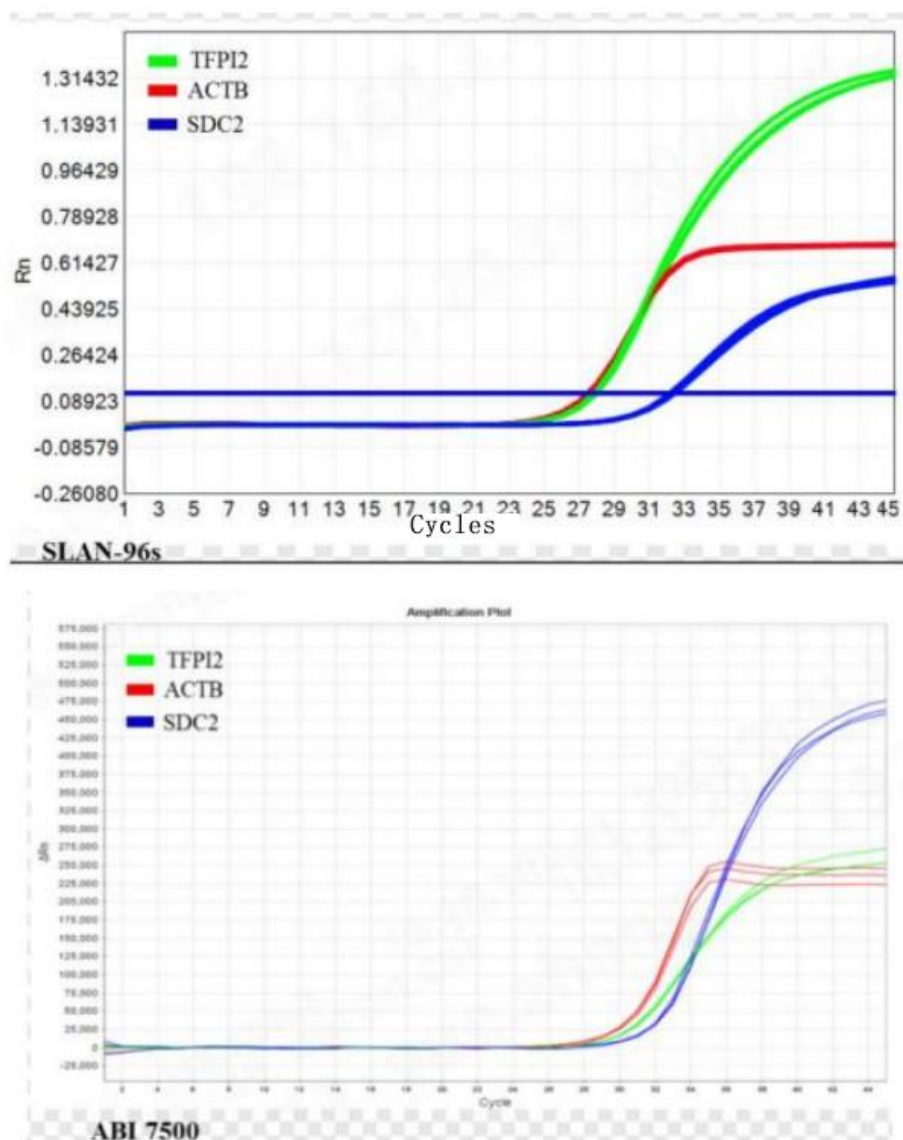


Figure 1. Amplification plots for TFPI2, ACTB, and SDC2 generated on SLAN-96s and ABI 7500 instruments.

Quality Control

QC Item	Method	Acceptance / Reference
Component and label check	Inspect on receipt	All ordered components, volumes, lot numbers, and expiry information are present and legible.
Positive-control amplification	Run a validated target and template under established conditions	Amplification is detected within the laboratory's validated acceptance criteria.

QC Item	Method	Acceptance / Reference
No-template control	Run the complete reaction without template	No target-specific amplification within the laboratory's validated acceptance criteria.

Troubleshooting

Issue	Possible Causes	Corrective Action
No or weak amplification	Low-quality bisulfite-converted DNA; inadequate template; incorrect setup	Use freshly prepared high-quality template, verify reagent additions, and optimize template amount within the stated range.
Non-specific amplification	Excessive template; primer/probe design or concentration; setup warmed before cycling	Reduce template input, optimize primer/probe conditions, and prepare reactions on ice.
Inconsistent replicates	Pipetting error; incomplete mixing; bubbles	Prepare a master mix, mix gently and thoroughly, briefly centrifuge, and remove bubbles before cycling.

Recommended Applications

Probe-based fluorescent quantitative PCR and amplification of uracil-containing or damaged DNA templates, particularly DNA subjected to bisulfite conversion.

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Limitations & Disclaimer

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