Taq DNA Polymerase

Cat. No.: HYA110

Product Description

Taq DNA Polymerase is a highly thermostable DNA polymerase derived from the thermophilic bacterium Thermus aquaticus. The enzyme reaction requires the participation of Mg^{2+} and can catalyze the polymerization of deoxynucleotides from the 5' to 3' direction that depends on the DNA template. The Taq DNA Polymerase developed by our company is a high-purity enzyme protein obtained by recombinant expression of the Thermus aquaticus DNA Polymerase gene in *Escherichia coli* and purification through multi-step chromatography separation. It has the same properties as natural Taq DNA polymerase.

Components

1. 5 U/μL Taq DNA Polymerase
2. 10 × PCR Buffer (Mg^{2+} free) (optional)
3. 25 mM $MgCl_2$ (optional)

*10 × PCR Buffer (Mg^{2+} free) does not contain dNTPs and Mg^{2+}; please add dNTPs and $MgCl_2$ when preparing the reaction system.

Activity Definition

One activity unit (U) is defined as the amount of enzyme required to incorporate 10 nmol of deoxynucleotides into acid-insoluble material, using activated salmon sperm DNA as the template/primer, under the conditions of 74℃ for 30 minutes.

Storage

Store at -20℃ for long-term storage. Mix thoroughly before use and avoid repeated freeze-thaw cycles.

Quality Control

1. Electrophoretic purity by SDS-PAGE ≥ 98%.
2. Amplification sensitivity, inter-batch variation, and stability.
3. Free of extraneous nuclease activity, as well as extraneous endonuclease and exonuclease contamination.

Instructions

1. PCR reaction system

Components	Volume	Concentration in Master Mix
10 × PCR Buffer (Mg^{2+} free)*	5 μL	1×
dNTPs (10 mM each dNTP)	1 μL	200 μM
25 mM $MgCl_2$	2-8 μL	1-4 mM
5 U/μL Taq DNA Polymerase	0.25-0.5 μL	1.25-2.5 U
25 × Primer Mix**	2 μL	1×
Template	——	< 1 μg/reaction
ddH_2O	Up to 50 μL	——

*10 × PCR Buffer does not contain dNTPs or Mg^{2+}, and must be supplemented with dNTPs and $MgCl_2$ before use.

**If used for qPCR/qRT-PCR, a fluorescent probe must be added to the reaction system. Typically, a final primer concentration of 0.2 μM yields optimal results; if the reaction performance is unsatisfactory, the primer concentration can be adjusted within the range of 0.2–1 μM. Generally, the probe concentration is optimized within 0.1–0.3 μM. Concentration gradient experiments can be performed to identify the optimal combination of primers and probes.

2. Reaction Program

Three-step method			
Step	**Temperature**	**Time**	**Cycles**
Pre-denaturation	95 ℃	30 s	1
Denaturation	95 ℃	10-20 s	35-50
Annealing	56~64 ℃	10-30 s	
Extension	72 ℃	10-60 s	

Technical Specifications

1. It has 5’-3’ polymerase and 5’-3’ exonuclease activity; it has no 3’-5’ exonuclease activity and no proofreading function.
2. At 70~75℃, the extension rate is 1~2 kb/min.

3. The 3’ end of the PCR product is A, and the product can be directly cloned into a T vector.
4. It is suitable for qualitative and quantitative detection of ordinary PCR and RT-PCR.
5. It is suitable for fluorescence quantitative PCR detection, DNA sequencing, etc.
6. For Research Use Only.