AceTaq® DNA Polymerase

P401

Version 21.1

Product Description

AceTaq DNA Polymerase is a chemically modified Taq DNA Polymerase that is completely blocked at room temperature and is released only after heating at 95℃. Non-specific amplification and primer dimerization can be prevented during sample preparation and temperature rise. Compared with the antibody-based hot-start Taq, the polymerase activity of AceTaq DNA Polymerase is blocked more stringently and completely. It takes only 5 min to activate AceTaq DNA Polymerase. AceTaq DNA Polymerase is compatible with most existing PCR protocols. Combined with an optimized buffer system, AceTaq DNA Polymerase minimizes non-specific amplification and primer dimers, ensuring extremely high sensitivity and specificity, which make it ideal for amplifying low-copy genes from complex templates. The PCR products contain A at the 3' end and can be directly cloned into T-Vector. The products are compatible with ClonExpress and Top Cloning kits (Vazyme #C112/C113/C115/C601).

Components

Components	P401-d1	P401-d2	P401-d3
10 × AceTaq Buffer (Mg^{2+} Plus)	1 ml	4 × 1 ml	
dNTP Mix (10 mM each)	200 µl	800 µl	3 × P401-d2
AceTaq DNA Polymerase (5 U/µl)	50 µl	200 µl	

Storage

Store at -30 ~ -15℃ and transport at ≤0℃.

Applications

This product is suitable for DNA amplification from various type of templates such as genomic DNA, cDNA, plasmid DNA and λDNA.

Source

It is cloned from *Thermus aquaticus* and purified from *E. coli*.

Unit Definition

One unit (U) is defined as the amount of enzyme that incorporates 10 nmol of dNTP into acid-insoluble material in 30 min at 74℃ with activated salmon sperm DNA as the template/primer.

Notes

For research use only. Not for use in diagnostic procedures.

Experiment Process

Reaction system

ddH_2O	to 50 µl
10 × AceTaq Buffer (Mg^{2+} plus)	5 µl
dNTP Mix (10 mM each)	1 µl
Template DNA[a]	x µl
Primer 1 (10 µM)	2 µl
Primer 2 (10 µM)	2 µl
AceTaq DNA Polymerase (5 U/µl)[b]	0.5 µl

a. The optimal concentration for various templates is different. The recommended amount of DNA template for a 50 µl reaction is as follows:

Human genomic DNA	1 - 500 ng
E. coli genomic DNA	1 - 100 ng
λDNA	0.1 - 1 ng
Plasmid DNA	0.1 - 1 ng

b. The amount of AceTaq DNA Polymerase can be adjusted between 0.25 - 1 µl. Increasing the amount of enzyme may increase the yield, but it may also reduce the specificity.

PCR Program

95°C	5 min[a] (initial-denaturation)	
95°C	30 sec	30 - 35 cycles
55°C[b]	30 sec	
72°C	60 sec/kb	
72°C	7 min (final extension)	

a. The initial denaturation takes at least 5 min. If the amplification is not ideal, extend the initial-denaturation time up to 10 min.
b. Annealing temperature is based on the Tm value of the primers and is generally 3 ~ 5°C lower than the calculated Tm value.

Primer Design Guidance

1. It is recommend that the last base at the 3' end of primer should be G or C.
2. Consecutive mismatches should be avoided in the last 8 bases at the 3' end of the primer.
3. Avoid hairpin structures at the 3' end of the primer.
4. Differences in the Tm value of the forward primer and the reverse primer should be no more than 1°C and the Tm value should be adjusted to 55°C to 65°C (Primer Premier 5 is recommended to calculate the Tm value).
5. Extra additional primer sequences that are not matched with the template, should not be included when calculating the primer Tm value.
6. Control the GC content of the primer to be 40% - 60%.
7. The overall distribution of A, G, C and T in the primer should be as even as possible. Avoid using regions with high GC or AT contents.
8. Avoid the presence of complementary sequences of 5 or more bases either within the primer or between two primers and avoid the presence of complementary sequences of 3 or more bases at the 3' end of two primers.
9. Use the NCBI BLAST function to check the specificity of the primer to prevent non-specific amplification.