pEASY®-T5 Zero Cloning Kit

Please read the user manual carefully before use.

Cat. No.CT501

Storage

*Trans*1-T1 Phage Resistant Chemically Competent Cell at -70°C for six months; others at -20°C for nine months

Descriptions

This product selects positive recombinants by expression of a lethal gene. When the vector is not ligated to the insert, the lethal gene is expressed to kill the cells containing the vectors, enabling zero background. It is suitable for TA cloning.

- Fast: 5 minutes only.
- Easy: Only adding the insert is needed.
- Highly efficient: Almost 100% high positive rate.
- Low background: Close to zero.
- No blue/white selection needed.
- Suitable for short and large fragment cloning.
- Kanamycin and Ampicillin resistance genes are convenient for selection according to experimental conditions.
- M13 forward primer and M13 reverse primer for sequencing.
- T3 promoter and T7 promoter for *in vitro* transcription.
- *Trans*1-T1 Phage Resistant Chemically Competent Cell features high transformation efficiency and fast growth, generating sufficient colonies to save time..

Kit Contents

Component	CT501-01 (20 rxns)	CT501-02 (60 rxns)
pEASY ®- T5 Zero Cloning Vector (10 ng/μl)	20 μl	3×20 μl
Control Template (5 ng/μl)	5 μl	5 μl
Control Primers (10 μM)	5 μl	5 μl
M13 Forward Primer (10 μM)	50 μl	150 μl
M13 Reverse Primer (10 μM)	50 μl	150 μl
Trans 1-T1 Phage Resistant Chemically Competent Cell	10×100 μl	30×100 μl

Preparation of PCR Products

1. Primer requirement: primer cannot be phosphorylated
2. PCR Enzyme: *Taq* DNA polymerases
3. Reaction conditions: in order to ensure the integrity of amplification products, 5-10 minutes of post-extension step is required. After amplification reaction, use agarose gel electrophoresis to verify the quality and quantity of PCR product

Setting Up the Cloning Reaction System

Add following components into a microcentrifuge tube.

PCR products 0.5-4 μl (can be increased or reduced based on PCR product yeild, not more than 4 μl)

pEASY ®- T5 Zero Cloning Vector 1 μl

Gently mix well, incubate at room temperature (20°C-37°C) for 5 minutes, and then place the tube on the ice.

1. Optimal amount of insert
   Molar ratio of vector to insert = 1:7 (1 kb, ~20 ng; 2 kb, ~40 ng)
2. Optimal volume of vector: 1 μl (10 ng)
3. Optimal reaction volume: 3~5 μl
4. Optimal incubation time

(1) 0.1~1 kb (including 1 kb): 5~10 minutes

(2) 1~2 kb (including 2 kb): 10~15 minutes

(3) 2~3 kb (including 3 kb): 15~20 minutes
(4) ≥3 kb: 20~30 minutes
Use the maximum incubation time if the insert is gel purified.
5. Optimal incubation temperature: for most PCR inserts, the optimal temperature is about 25°C; for some PCR inserts, optimal results can be achieved with higher temperature (up to 37°C).

Transformation

1. Add the ligated products to 50 µl of *Trans1*-T1 Phage Resistant Chemically Competent Cell and mix gently (do not mix by pipetting up and down).
2. Incubate on ice for 20~30 minutes.
3. Heat-shock the cells at 42°C for 30 seconds.
4. Immediately place the tube on ice for 2 minutes.
5. Add 250 µl of room temperature SOC or LB medium. Shake the tube at 37°C (200 rpm) for 1 hour.
6. Spread 200 µl or all transformants on the pre-warmed plate. Incubate at 37°C overnight.

Test of Positive Clones

Identification of Positive Clones by PCR

(1) Pick white colonies into 10 µl Nuclease-free Water and vortex.
(2) Use 1 µl of the mixture as template for 25 µl PCR reaction using M13 forward and M13 reverse primers.
(3) PCR reaction conditions

94°C	10 min	
94°C	30 sec	30 cycles
55°C	30 sec	
72°C	x min*	
72°C	5-10 min	

* (The extension time depends on insert size.)

Analysis of positive clones by restriction enzyme digestion

Pick white colonies on LB/Amp$^+$ or LB/Kan$^+$ liquid medium, and grow at 37°C for 6 hours at 200 rpm. Isolate plasmid DNA by plasmid MiniPrep Kit. Analyze plasmid by restriction enzyme digestion with proper restriction endonuclease.

Sequencing

Analyze the sequence by sequencing with M13 F, M13 R and T7 promoter.

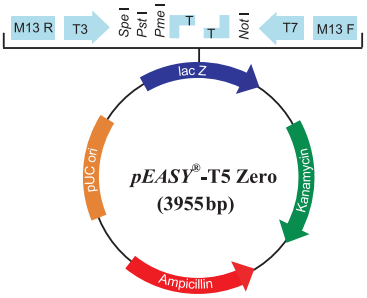
PCR system and conditions for control insert (700 bp)

Component	Volume	Final Concentration
Control Template (5 ng/µl)	1 µl	0.1 ng/µl
Control Primers (10 µM)	1 µl	0.2 µM
2×*EasyTaq*® PCR SuperMix	25 µl	1×
Nuclease-free Water	Variable	-
Total volume	50 µl	-

Thermal cycling conditions for control insert

94℃	2~5 min	
94℃	30 sec	30 cycles
55℃	30 sec	
72℃	1 min	
72℃	10 min	

The control insert is used to test the cloning efficiency of the vector. The colony count is 500-1000 after transformation with 1µl of PCR product.



pEASY ®- Blunt Cloning Vector Map

*LacZ*α fragment: bases 217-809
M13 reverse priming site: bases 205-221
T7 promoter priming site: bases 327-346
M13 Forward priming site: bases 353-369
Kanamycin resistance ORF: bases 1,158-1,952
Ampicillin resistance ORF (c): bases 2,202-3,062
pUC origin: bases 3,160-3,833
(c) = complementary strand

M13 Reverse Primer
T3 Promoter
Spe I
Pst I
Pme I

TTC ACA CAG GAA ACA GCT ATG ACC ATG ATT ACG CCA AGC TCA GAA TTA ACC CTC ACT AAA GGG ACT AGT CCT GCA GGT TTA AAC
AAG TGT GTC CTT TGT CGA TAC TGG TAC TAA TGC GGT TCG AGT CTT AAT TGG GAG TGA TTT CCC TGA TCA GGA CGT CCA AAT TTG

Not I
T7 Promoter

GAA TTG GCC CTT PCR Product AA GGG CCA ATT CGC GGC CGC TAA ATT CAA TTC GCC CTA TAG TGA GTC GTA TTA CAA TTC
CTT AAC CGG GAA TT CCC GGT TAA GCG CCG GCG ATT TAA GTT AAG CGG GAT ATC ACT CAG CAT AAT GTT AAG

M13 Forward Primer

A CTG GCC GTC GTT TTA CAA
T GAC CGG CAG CAA AAT GTT

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