Product Catalog

YEASTERN BIOTECH

Timesaving

Easy

Accurate

MISSION

We are a Taiwan based molecular biology kits & reagents manufacturer which was founded in 2000 with the goal of providing the intelligent technical services and high quality products in life sciences and in the biomedical industry. We believe that a scientist's greatest help comes from fellow scientists. Therefore, our innovative interdisciplinary research team with highly qualified experts in different fields offers ODM or OEM research-only reagents and kits as well as diagnostic products.

AIM & PROSPECT

The spirits of innovation, integration and humanism in biotechnology are our executive prospects. Based on our possession of excellent research capability and professional technical platforms, we head for long-term aims at developing our own brand of life science and biomedical products.

STRATEGY

We are ISO9001, ISO13485 & GMP certified. Our guideline for product development is to offer time-saving, easy, and accurate (T.E.A.) products to meet our customers' needs. To promote our products and technical services, we strive towards establishing strategic alliance and collaboration with our distributors. We believe we are making impacts on the global biotech market with our innovative products and technology through sustainable and mutual partnership.

ISO 9001 | ISO 13485

Yeastern Biotech Co., Ltd.
www.yeastern.com | yeastern@yeastern.com

DNA/RNA EXTRACTION

PCR, RT-PCR & dNTPs

GENE CLONING

PROTEOMICS

OEM SERVICES & APPENDIX

DNA/RNA Extraction

UniversAll™ Tissue Extraction/PCR Kits

-20°C

 # FYU001-100P (100 preps)

UniversAll™ Extraction Buffer	5 ml
Primer U18S-F (10 μM)	20 μl
Primer U18S-R (10 μM)	20 μl
Primer P18S-F (10 μM)	20 μl
Primer P18S-R (10 μM)	20 μl
10× PCR Reaction Buffer (with 20 mM Mg^{2+})	500 μl
dNTPs Mix (10 mM)	50 μl
Uti DNA Polymerase (5 U/μl)	50 μl
Extraction Buffer Enhancer	250 μl

 # FYU002-5ML

UniversAll™ Extraction Buffer	5 ml
Extraction Buffer Enhancer	250 μl

 # FYU003-20ML

UniversAll™ Extraction Buffer for Animal Tissue	20 ml

Description

The UniversAll™ Tissue PCR Kits contain all the reagents necessary to rapidly extract genomic DNA from a wide range of biological samples prior to amplifying targets of interest by PCR. Genomic DNA is extracted from a small amount of samples simply by incubation in UniversAll™ Extract buffer for 10 minutes at 95 °C. The UniversAll™ Tissue PCR Kits offer a novel one-step UniversAll™ Extract buffer that eliminates the need for freezing cells or tissues with liquid nitrogen, mechanical disruption, organic extraction, column DNA purification, or alcohol precipitation.

Features

- **Simple:** single-step extraction of genomic DNA prior to PCR. No phenol/chloroform.
- **Fast:** cells or tissues to PCR in 10 minutes.
- **Convenient:** includes our superior PCR enzymes and buffers for amplification directly from the extract for your convenience.

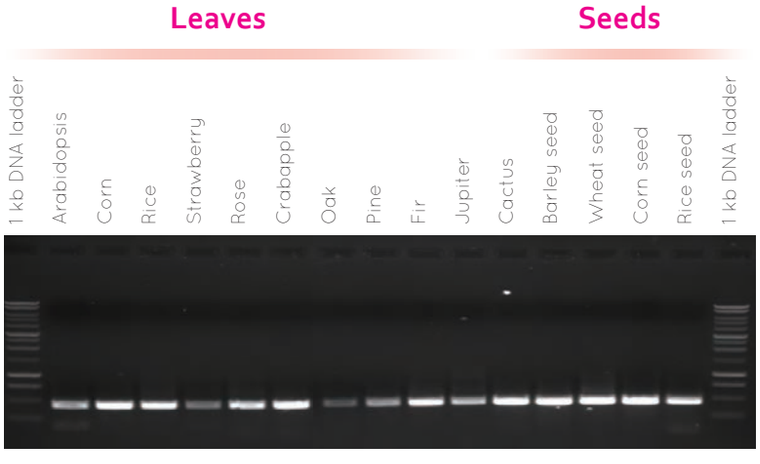
Applications

- Gene cloning
- Small or large scale PCR-based genotyping
- Traditional PCR; real-time PCR
- Suitable for rapid forensic and disease detection and diagnosis

Quality Control

Each lot of extraction buffer was tested for its extraction capability of standard animal and plant tissues for PCR and real-time PCR. It also has to pass the stability test before shipping.

Results



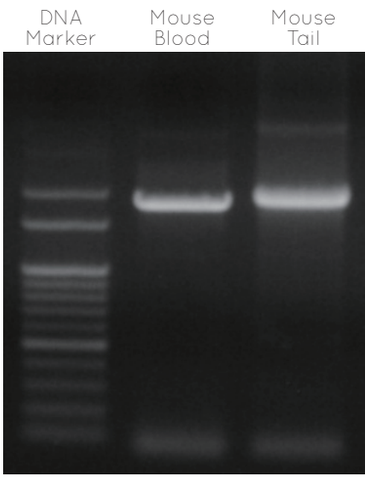
PCR analysis of genomic DNA extracted from 11 plant leaf tissues and seeds of 4 plant species with the P18S primer set.

Related Products

- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- O' in 1 DNA Polymerase Premix 2-3
- RealStart DNA Polymerase Premix 2-9
- EZtime Real-time PCR Premix 2-11
- ECOS™ Competent Cells 3-1
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

Mouse Tissue

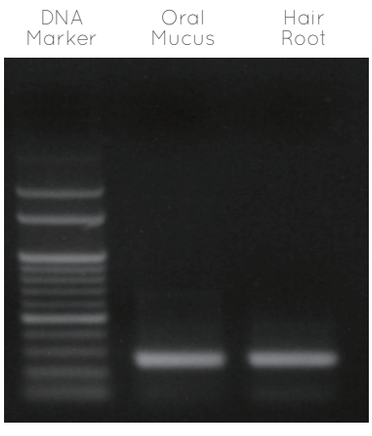
PCR analysis of genomic DNA extracted from ICR mouse blood and tail with a U18S primer set.



* Put 2 µl of mouse blood and a small piece (~1 mm^3) of mouse tail tip, respectively, into microcentrifuge tubes then extracted with UniversAll™ buffer.

Human Tissue

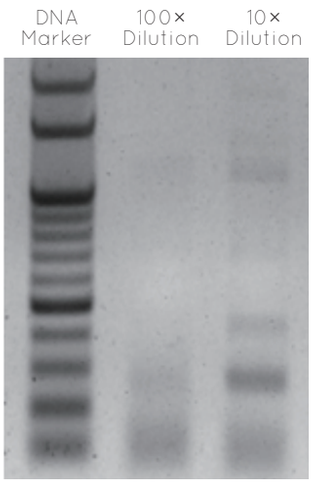
PCR analysis of genomic DNA extracted from human oral mucosal cells and human hair with a β-GBN primer set.



* Placed oral mucosal cells and three hair root ends into microcentrifuge tubes then extracted with UniversAll™ buffer.

Paraffin Sample

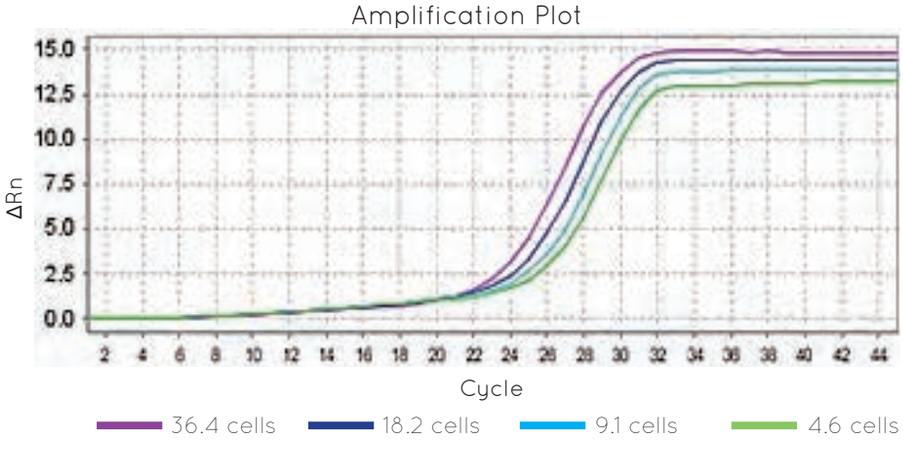
Genomic DNA extracted from paraffin embeded mouse liver with a β-GBN primer set.



* Samples were cut into small pieces, pre-washed with xylene and alcohol then extracted with UniversAll™ buffer.

Real-time Quantitative PCR

Real-time quantitative PCR analysis of *E. coli* plasmid DNA extracted by UniversAll™ extraction buffer.



* As few as 4.6 cells in the sample can be detected easily.

BioTake™ Tissue Puncher

RT

 # FYU101-1PC (1 piece)

BioTake™ Tissue Puncher	1 pc

 # FYU102-96PC (96 pieces)

BioTake™ Tissue Puncher Tips 0.8 mm	96 pcs/box

 # FYU103-96PC (96 pieces)

BioTake™ Tissue Puncher Tips 1.8 mm	96 pcs/box

Description

The YB BioTake™ Tissue Puncher coupled with specially designed BioTake™ Tissue Puncher Tip is a convenient sampling tool for cutting very small tissue discs from biological samples such as animal tissues and plant leaves as well as DNA/RNA and protein bands from electrophoresis gels. The YB BioTake™ Tissue Puncher Tip is designed for one-time usage to prevent cross-contamination between samples. If reused, keeping within three times is recommended. Currently, two core sizes of the tips are available: 0.8 mm and 1.8 mm. The YB BioTake™ Tissue Puncher Tip provided in tip racks are gamma-ray sterilized during manufacturing process and are autoclavable if desired.

Features

- **Simple:** just press and eject!
- **No cross contamination:** use of disposable tips avoids cross contamination.
- **Convenient:** 1.8 mm and 0.8 mm BioTake™ Tissue Puncher Tips for your selection.

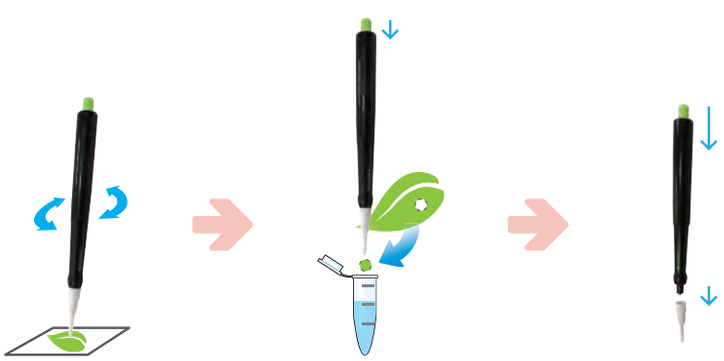
Applications

- Cut, retrieve and store samples from animal and plant tissues

Quality Control

The appearances of BioTake™ Tissue Puncher and BioTake™ Tissue Puncher Tips are examined by visual inspection for scratches and chipping damage. The function and the fitness of BioTake™ Tissue Puncher and BioTake™ Tissue Puncher Tips are tested by actual operating procedures to verify its conformity with product specifications.

Protocol



Slightly press downward and rotate the puncher

Press the plunger to the first stop to eject the punch disc

Press the plunger to the second stop to eject the tip

Related Products

- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- O' in 1 DNA Polymerase Premix 2-3
- RealStart DNA Polymerase Premix 2-9
- EZtime Real-time PCR Premix 2-11
- ECOS™ Competent Cells 3-1
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

HiYield Plasmid Mini Kit 2.0

RT

 # FYG007-100P (100 preps)

PDX1 Buffer	24 ml
PD2 Buffer	30 ml
PDX3 Buffer	40 ml
WX1 Buffer	60 ml
Wash Buffer	20 ml
Elution Buffer	10 ml
RNase A (20 mg/ml)	84 µl
PDX Column	100 pcs
2 ml Collection Tube	100 pcs

 # FYG007-300P (300 preps)

PDX1 Buffer	72 ml
PD2 Buffer	90 ml
PDX3 Buffer	120 ml
WX1 Buffer	180 ml
Wash Buffer	60 ml
Elution Buffer	30 ml
RNase A (20 mg/ml)	252 µl
PDX Column	300 pcs
2 ml Collection Tube	300 pcs

Description

HiYield Plasmid Mini Kit 2.0 is specially designed for rapid isolation of plasmid or cosmid DNA from 1-5 ml of bacterial cultured cells. As high as 40 µg of high quality plasmid DNA can be purified in less than 30 minutes and is ready for restriction digestion, ligation, PCR, and sequencing reaction.

No phenol extraction or alcohol precipitation is required in this protocol. In the process, clear and extra pure cell lysate with minimal genomic DNA and RNA contaminants can be obtained through the modified alkaline lysis method and RNase treatment. In the presence of a chaotropic salt, the plasmid DNA within the lysate will then bind to the glass fiber matrix equipped in the spin column. The contaminants are washed away with an ethanol-containing wash buffer. Finally, the purified plasmid DNA is eluted by a low salt elution buffer or distilled water. Typical yields of high-purity are 20~40 µg for high-copy number plasmids or 3~10 µg for low-copy number plasmids.

Features

- **Sample :** 1-5 ml of bacterial cells
- **Format :** spin column (centrifuge)
- **Yield :** up to 40 µg of plasmid/cosmid DNA
- **Operation time :** up to 30 minutes
- **Elution volume :** 30-50 µl

Applications

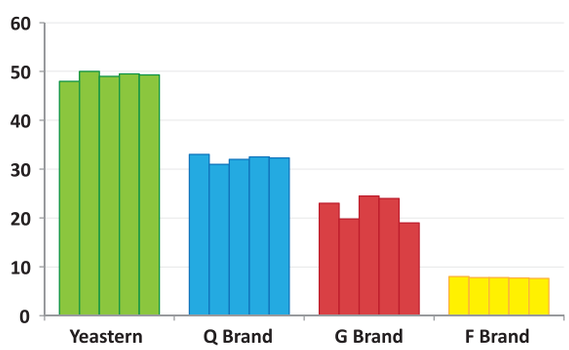
Restriction enzyme digestion, library screening, ligation, PCR,transformation/ sequencing reactions

Quality Control

The quality of HiYield Plasmid Mini Kit 2.0 is tested on a lot-to-lot basis. The kit is tested by isolation of plasmid DNA from 5 ml culture of *E. coli* DH5α transformed with the plasmid pGAD424 (A_{600}>2 units/ml). More than 40 µg of plasmid DNA should be obtained. One µg of the purified product is also tested for restriction enzyme digested with *EcoR* I followed by agarose gel analysis.

Results

Performance of Yeastern Biotech's HiYield Plasmid Mni Kit 2.0



Sample : *E. coli* DH5α
Plasmid : GAD424 (6.6 kb)
Preparation : 16 hours overnight LB culture, 5 ml for each preparation

Related Products

- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- O' in 1 DNA Polymerase Premix 2-3
- RealStart DNA Polymerase Premix 2-9
- EZtime Real-time PCR Premix 2-11
- ECOS™ Competent Cells 3-1
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

HiYield Gel/PCR DNA Fragments Extraction Kit 2.0

RT

 # FYG206-100 (100 preps)

EZ Buffer	60 ml
W1 Buffer	45 ml
W2 Buffer	15 ml
Elution Buffer	10 ml
EZ Column	100 pcs
Collection Tube	100 pcs

 # FYG206-300 (300 preps)

EZ Buffer	80 ml x2
W1 Buffer	125 ml
W2 Buffer	25 ml x2
Elution Buffer	30 ml
EZ Column	300 pcs
Collection Tube	300 pcs

Description

The HiYield Gel/PCR DNA Fragments Extraction Kit 2.0 is designed to recover or concentrate DNA fragments (50 bp-10 kb) from agarose gels in 20 mins, PCR or other enzymatic reactions. The unique dual purpose application and high yield mini columns make this kit valuable. The method uses a chaotropic salt, guanidine thiocyanante to dissolve agarose gel and denature enzymes. DNA fragments in chaotropic salt solution bind to the glass fiber matrix of the spin column. Following washing off contaminants, the purified DNA fragments (Effective Binding Capacity Approx: 20 ug) are eluted by addition of low salt elution buffer or water. Salts, enzymes and unincorporated nucleotides are effectively removed from reaction mixtures without phenol extraction or alcohol precipitation.

Features

- **Recovery :** Up to 95%
- **Operation time :** within 20 minutess

Sample

100 µl PCR Product, 300 mg of Agarose Gel

Applications

Fluorescent/radioactive sequencing, PCR, restriction enzyme digestion, DNA labeling and ligation

Genomic DNA Extraction Mini Kit (Blood and Urine)

RT

 # FYG109-100 (100 preps)

B1 Buffer	100 ml
B2 Buffer	35 ml
B3 Buffer	12 ml
BC Buffer	45 ml
W1 Buffer	45 ml
W2 Buffer	15 ml
Elution Buffer	10 ml
BZ Column	100 pcs
Collection Tube	100 pcs

Description

The Genomic DNA Extraction Mini Kit (Blood and Urine) is designed for rapid extraction of pure genomic DNA from Bacteria and fungus cell. Efficiently remove cellular debris and inhibitors, this kit using column-type tube in purification process through three simple steps of binding, washing and then elution for the safe and convenient extraction of high-purity genomic DNA. The entire process can be completed in less than 1 hour without phenol/chloroform, and the final product can be used in PCR or other downstream experiments.

Features

- **Format :** spin column (centrifuge)
- **Yield :** up to 50 µg

Sample

310^9 Bacteria, 5 x 10^7 Fungus cells

Applications

PCR, AFLP/PADP, RFLP, Southern blot, real-time PCR

Genomic DNA Extraction Kit (Tissue) 2.0

RT

 # FYG111-100 (100 preps)

T1 Buffer	35 ml
T2 Buffer	12 ml
W1 Buffer	45 ml
W2 Buffer	15 ml
Elution Buffer	10 ml
GZ Column	100 pcs
Collection Tube	100 pcs
Proteinase K	20 mg

 # FYG111-300 (300 preps)

T1 Buffer	95 ml
T2 Buffer	35 ml
W1 Buffer	125 ml
W2 Buffer	25 ml x2
Elution Buffer	30 ml
GZ Column	300 pcs
Collection Tube	300 pcs
Proteinase K	60 mg

Description

The Genomic DNA Extraction Kit (Tissue) 2.0 is designed for rapid extraction of pure genomic DNA from animal tissue or paraffin-embedded tissue. Efficiently remove cellular debris and inhibitors, this kit using column-type tube in purification process through three simple steps of binding, washing and then elution for the safe and convenient extraction of high-purity genomic DNA. The entire process can be completed in less than 1 hour without phenol/chloroform, and the final product can be used in PCR or other downstream experiments

Features

- **Format :** spin column (centrifuge)
- **Yield :** up to 50 µg

Sample

330 mg of fresh animal tissue, 25 mg of paraffin-embedded tissue

Applications

PCR, AFLP/PADP, RFLP, Southern blot, real-time PCR

Genomic DNA Extraction Kit (Plant) 2.0

RT

 # FYG112-100 (100 preps)

PZ Buffer	55 ml
W1 Buffer	45 ml
W2 Buffer	15 ml
Elution Buffer	10 ml
GZ Column	100 pcs
Collection Tube	100 pcs

 # FYG112-300 (300 preps)

PZ Buffer	125 ml, 30 ml
W1 Buffer	125 ml
W2 Buffer	25 ml x2
Elution Buffer	30 ml
GZ Column	300 pcs
Collection Tube	300 pcs

Description

The Genomic DNA Extraction Kit (Plant) 2.0 is designed for rapid extraction of pure genomic DNA from plant tissue or dry plant tissue. Efficiently remove cellular debris and inhibitors, this kit using column-type tube in purification process through three simple steps of binding, washing and then elution for the safe and convenient extraction of high-purity genomic DNA. The entire process can be completed in less than 1 hour without phenol/chloroform, and the final product can be used in PCR or other downstream experiments

Features

- **Format :** spin column (centrifuge)
- **Yield :** up to 50 µg

Sample

100 mg of fresh plant tissue, 50 mg of dry plant tissue

Applications

PCR, AFLP/PADP, RFLP, Southern blot, real-time PCR

Genomic DNA Extraction Kit (Bacteria/Fungi) 2.0

RT

 # FYG115-100 (100 preps)

N1 Buffer	100 ml
N2 Buffer	35 ml
N3 Buffer	45 ml
W1 Buffer	45 ml
W2 Buffer	15 ml
Elution Buffer	10 ml
GZ Column	100 pcs
Collection Tube	100 pcs

Description

The Genomic DNA Extraction Kit (Bacteria/Fungi) 2.0 is designed for rapid extraction of pure genomic DNA from Bacteria and fungus cell. Efficiently remove cellular debris and inhibitors, this kit using column-type tube in purification process through three simple steps of binding, washing and then elution for the safe and convenient extraction of high-purity genomic DNA. The entire process can be completed in less than 1 hour without phenol/chloroform, and the final product can be used in PCR or other downstream experiments.

Features

- **Format :** spin column (centrifuge)
- **Yield :** up to 50 µg

Sample

10^9 Bacteria, 5 x 10^7 Fungus cells

Applications

PCR, AFLP/PADP, RFLP, Southern blot, real-time PCR

Genomic DNA Extraction kit (Cultured Cell) 2.0

RT

 # FYG117-100 (100 preps)

N1 Buffer	100 ml
N2 Buffer	35 ml
N3 Buffer	45 ml
W1 Buffer	45 ml
W2 Buffer	15 ml
Elution Buffer	10 ml
GZ Column	100 pcs
Collection Tube	100 pcs

 # FYG117-300 (300 preps)

N1 Buffer	100 ml x3
N2 Buffer	95 ml
N3 Buffer	125 ml
W1 Buffer	125 ml
W2 Buffer	25 ml x2
Elution Buffer	30 ml
GZ Column	300 pcs
Collection Tube	300 pcs

Description

The Genomic DNA Extraction kit (Cultured Cell) 2.0 is designed for rapid extraction of pure genomic DNA from Cultured Cell. Efficiently remove cellular debris and inhibitors, this kit using column-type tube in purification process through three simple steps of binding, washing and then elution for the safe and convenient extraction of high-purity genomic DNA. The entire process can be completed in less than 1 hour without phenol/chloroform, and the final product can be used in PCR or other downstream experiments.

Features

- **Format :** spin column (centrifuge)
- **Yield :** up to 50 µg

Sample

10^7 Cultured Cell

Applications

PCR, AFLP/PADP, RFLP, Southern blot, real-time PCR

Total RNA kit (Cell/Blood)

RT

 # FYG310-100 (100 preps)

CR1 Buffer	110 ml
CR2 Buffer	45 ml
W1 Buffer	45 ml
W2 Buffer	15 ml
Elution Buffer	10 ml
RZ Column	100 pcs
Collection Tube	100 pcs

 # FYG310-300 (300 preps)

CR1 Buffer	110 ml x3
CR2 Buffer	125 ml
W1 Buffer	125 ml
W2 Buffer	25 ml x2
Elution Buffer	30 ml
RZ Column	300 pcs
Collection Tube	300 pcs

Description

The Total RNA kit (Cell/Blood) is designed specifically for purifying total RNA from fresh whole human blood and cultured cells. Detergents and a chaotropic salt are used to lyse cells and inactivate RNase. RNA in the chaotropic salt is bound to the glass fiber matrix of the spin column and once any contaminants have been removed using the Wash Buffer, the purified total RNA is eluted by the Elution Buffer.

Features

- **Format :** spin column (centrifuge)
- **Yield :** Up to 30 µg

Sample

10^7 x Culture Cells, 300 µl of blood

Applications

RT-PCR, Northern blotting, primer extension, mRNA selection cDNA synthesis

Total RNA kit (Blood/ Bacteria)

RT

 # FYG306-100 (100 preps)

BR1 Buffer	110 ml
BR2 Buffer	45 ml
BR3 Buffer	25 ml
W1 Buffer	45 ml
W2 Buffer	15 ml
Elution Buffer	10 ml
RZ Column	100 pcs
Collection Tube	100 pcs

 # FYG306-300 (300 preps)

BR1 Buffer	100 ml x 3
BR2 Buffer	125 ml
BR3 Buffer	65 ml
W1 Buffer	125 ml
W2 Buffer	25 ml x2
Elution Buffer	30 ml
RZ Column	300 pcs
Collection Tube	300 pcs

Description

The Total RNA kit (Blood/ Bacteria) is designed specifically for purifying total RNA from fresh whole human blood and Bacteria. Detergents and a chaotropic salt are used to lyse cells and inactivate RNase. RNA in the chaotropic salt is bound to the glass fiber matrix of the spin column and once any contaminants have been removed using the Wash Buffer, the purified total RNA is eluted by the Elution Buffer.

Features

- **Format :** spin column (centrifuge)
- **Yield :** Up to 30 µg

Sample

10^9 x Bacteria Cells, 300 µl of blood

Applications

RT-PCR, Northern blotting, primer extension, mRNA selection cDNA synthesis

Total RNA Kit (Tissue) 2.0

RT

 # FYG307-100 (100 preps)

TR Buffer	45 ml
W1 Buffer	45 ml
W2 Buffer	15 ml
Elution Buffer	10 ml
DNase Incubation Buffer	10 ml
RZ Column	100 pcs
Collection Tube	100 pcs

 # FYG307-300 (300 preps)

TR Buffer	125 ml
W1 Buffer	125 ml
W2 Buffer	25 ml x2
Elution Buffer	30 ml
DNase Incubation Buffer	30 ml
RZ Column	300 pcs
Collection Tube	300 pcs

Description

The Total RNA Kit (Tissue) 2.0 is designed specifically for purifying total RNA from ffresh animal tissue or paraffin-embedded tissue. Detergents and a chaotropic salt are used to lyse cells and inactivate RNase. RNA in the chaotropic salt is bound to the glass fiber matrix of the spin column and once any contaminants have been removed using the Wash Buffer, the purified total RNA is eluted by the Elution Buffer.

Features

- **Format :** spin column (centrifuge)
- **Yield :** Up to 30 µg

Sample

30 mg of fresh animal tissue, 25 mg of paraffin-embedded tissue

Applications

RT-PCR, Northern blotting, primer extension, mRNA selection cDNA synthesis

Total RNA Kit (Plant) 2.0

RT

 # FYG308-100 (100 preps)

PR Buffe	110 ml
W1 Buffer	45 ml
W2 Buffer	15 ml
Elution Buffer	10 ml
RZ Column	100 pcs
Collection Tube	100 pcs

 # FYG308-300 (300 preps)

PR Buffer	105 ml x3
W1 Buffer	125 ml
W2 Buffer	25 ml x2
Elution Buffer	30 ml
RZ Column	300 pcs
Collection Tube	300 pcs

Description

The Total RNA Kit (Plant) 2.0 is designed specifically for purifying total RNA from plant tissue or dry plant tissue. Detergents and a chaotropic salt are used to lyse cells and inactivate RNase. RNA in the chaotropic salt is bound to the glass fiber matrix of the spin column and once any contaminants have been removed using the Wash Buffer, the purified total RNA is eluted by the Elution Buffer.

Features

- **Format :** spin column (centrifuge)
- **Yield :** Up to 30 µg

Sample

100 mg of plant Tissue, 25 mg of dry plant Tissue

Applications

RT-PCR, Northern blotting, primer extension, mRNA selection cDNA synthesis

miRNA Isolation Kit 2.0

RT

 # FYG309-050 (50 preps)

RBC Lysis Buffer	120 ml
RT Buffer	15 ml
NR Buffer	30 ml
70% Ethanol	9 ml
RW2 Buffer	25 ml
RNase free water	10 ml
RS Column (Yellow Ring)	50 pcs
miR Column (Blue Ring)	50 pcs
Collection Tube	100 pcs

Description

The miRNA Isolation Kit 2.0 is designed for purifying micro RNAs (miRNAs) and other small cellular RNAs from whole blood, cultured cells, bacteria (Gram +/-), fungus cells and tissue. Standard protocols for isolating total RNA and mRNA are not optimized for isolation of small RNA molecules and result in the loss of substantial amounts of miRNAs and other small RNA. In addition, removal of the predominantly lager RNAs is required for accurate analysis of miRNA expression by qPCR or microarray analysis. This kit ensures purification of small RNA with minimal contamination from large RNA molecules or genomic DNA. In the presence of a chaotropic salt, and various ethanol concentrations in the solvent, RNA molecules (of various sizes) are selectively bound to the glass fiber matrix.

Features

- **Format :** spin column (centrifuge)
- **Yield :** Up to 20 µg

Sample

500 µl Whole Blood, 10^6 Cultured Cells, 10^8 Bacteria (Gram +/-), $5x10^6$ fungus cells, 10 mg Tissue

Applications

Northern blot analysis, quantitative, real-time RT-PCR, microarray analysis

Viral Nucleic Acid Extraction Kit 2.0

RT

 # FYG404-050 (50 preps)

VN Buffer	30 ml
VP Buffer	12 ml
Carrier RNA	1 mg
Wash Buffer	25 ml
RNase free water	10 ml
VS Column (Yellow Ring)	50 pcs

 # FYG404-300 (300 preps)

VN Buffer	180 ml
VP Buffer	65 ml
Carrier RNA	6 mg
Wash Buffer	25 ml x3
RNase free water	30 ml
VS Column (Yellow Ring)	300 pcs

Description

Viral Nucleic Acid Extraction Kit 2.0 is specially designed for purification of viral RNA or DNA from cell-free samples. With the extraction method included, DNA/RNA viruses are lysed quickly and efficiently by the lysis buffer which is a highly concentrated solution of a chaotropic salt. The lysis buffer and ethanol create appropriate conditions for the binding of nucleic acids to the glass fiber matrix of the blood viral DNA/RNA binding column. Contaminations like salts, metabolites and soluble macromolecular cellular components are removed in the wash steps. The nucleic acids can be eluted in low salt buffer or water and are ready-to-use in subsequent reactions.

Features

- **Format :** spin column (centrifuge)
- **Yield :** Up to 20 µg

Sample

serum, plasma, cell-culture supernatants, other cell-free body fluids

Applications

RT-PCR, PCR, Real-time PCR, Automated fluorescent DNA sequencing, Enzymatic reactions

YEA Ladder DNA Markers

Description

Yeastern Biotech combines size and mass marker ladders to provide superior resolution on agarose gel. 100 bp ladder DNA marker is ideal for fast running of PCR samples on agarose gel (**# FYD009-1ML**). 1 kb ladder DNA marker is ideal for size determination of digested DNA and long PCR products (**# FYD008-1ML**).

Features

- Sharp and clear banding patterns
- Mass marker bands for easy DNA quantification
- Accurate DNA migration on agarose gel

Applications

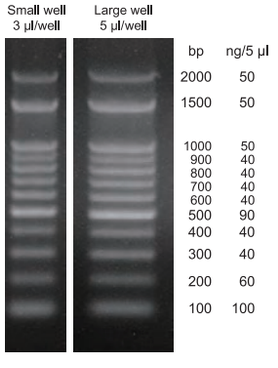
- Locating DNA of interest
- DNA quantification
- DNA tracking

Quality Control

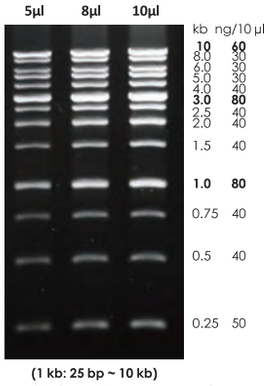
10 µl of YEA Ladder DNA Markers provide expected numbers of bands with accurate molecular weight on agarose gel after running electrophoresis.

Results

FYD005-500UL
100 bp DNA Marker

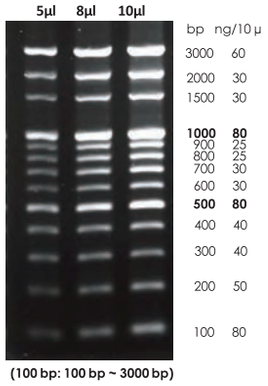


FYD008-1ML
1 kb DNA Marker II



(1 kb: 25 bp ~ 10 kb)
(1%, 1x TBE agarose gel)

FYD009-1ML
100 bp DNA Marker II



(100 bp: 100 bp ~ 3000 bp)

-20°C

 # FYD003-3ML
6× Gel Loading Dye Solution 3 ml

 # FYD005-500UL
100 bp YEA Ladder DNA Marker (High Concentration)
64 µg/500 µl

 # FYD008-1ML
1 kb YEA Ladder DNA Marker II
60 µg/1 ml

 # FYD009-1ML
100 bp YEA Ladder DNA Marker II
60 µg/1 ml

Related Products

- Agarose Standard 1-13
- O' in 1 DNA Polymerase Premix 2-3
- RealStart DNA Polymerase Premix 2-9
- EZtime Real-Time PCR Premix 2-11
- ECOS™ Competent Cells 3-1
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

EtB"Out" Nucleic Acid Staining Solution

RT

 # FYD007-200P (200 preps)
EtB"Out" Nucleic Acid Staining Solution (20,000×) 1 ml

Description

EtB"Out" Nucleic Acid Staining Solution aims to replace traditional EtBr (ethidium bromide) in performing nucleic acid detection in agarose gels. EtBr has long been known as a strong mutagen, however EtB"Out" causes only neglectable mutations in the Ames test.
The sensitivity of EtB"Out" is identical to that of EtBr. Under UV light, EtB"Out" emits green fluorescence when bound to DNA or RNA. EtB"Out" can be excited at 309 nm, 419 nm and 514 nm. The fluorescence emission peak of EtB"Out" when bound to DNA is at 500 nm.

Features

- **Economic :** use only 5 µl in 100 ml of agarose gel
- **Sensitive :** sensitivity is comparable and even better than EtBr, DNA concentration as low as 5 ng can be detecded
- **Safe :** non-mutagenic, non-toxic, non carcinogenic
- **Green :** no hazardous waste

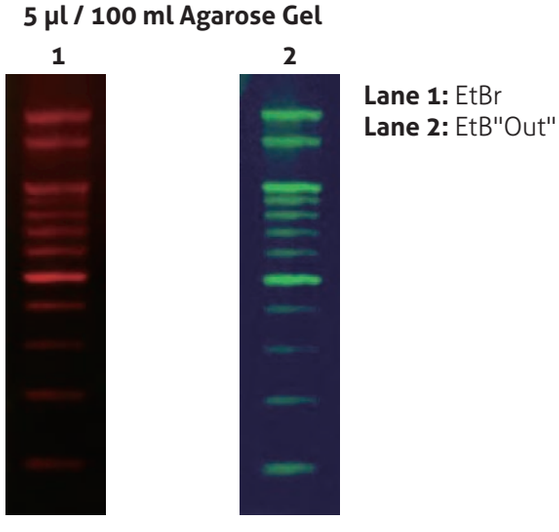
Applications

Nucleic acids detection (dsDNA and ssRNA) within agarose gel after electrophoresis under UV illumination

Quality Assurance

The quality of the EtB"Out" Nucleic Acid Staining Solution is tested on a lot-to-lot basis. Nucleic acids is extracted from tissues and serial diluted. Electrophoresis is performed and the agarose gel is stained with EtB"Out" Nucleic Acid Staining Solution to ensure the performance.

Results



Nucleic staining using EtB"Out" Nucleic Acid Staining Solution. Two individual agarose gels were prepared with 5 µl of EtBr and EtB"Out" respectively. Staining results were examined under UV illumination. Identical results were observed and EtB"Out" even showed a better staining result than using EtBr.

Related Products

- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- ECOS™ Competent Cells 3-1

Agarose Standard

Description

Agarose Standard is a polysaccharide obtained from agar that has been used for a variety of life science applications, especially in gel electrophoresis. Yeastern Biotech offers a molecular biology grade agarose, which is specially purified for separating and recovering DNA fragments. It provides the sharpest resolution of fragments of 50–30,000 base pairs and has high gel strength ensuring no gel breaking during handling. Yeastern Biotech Agarose Standard is a standard melting temperature, multi-purpose agarose that is ideal for routine DNA/RNA separation analysis, DNA fingerprinting, PCR, or restriction digest analysis. Since the strict quality control is performed during agarose preparation, the sufficient separation and the purity of recovered DNA are guaranteed.

Features

- **Gel strength :** ≥ 1,200 g/cm^2 (1.5%)
- **Melting point :** ≤ 90°C (1.5%)
- **Gelling temperature :** 37-39°C (1.5%)
- **Sulfate content (SO_4) :** ≤ 0.1%
- **Water content :** ≤ 10%
- **Electroendosmosis (-Mr) :** ≤ 0.1

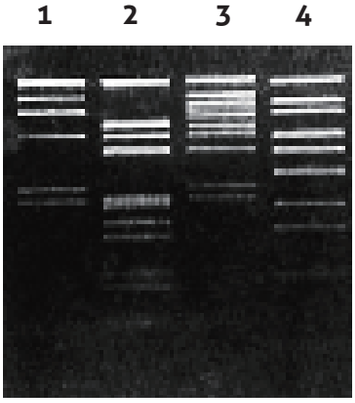
Applications

Routine DNA/RNA separation analysis, DNA fingerprinting, PCR, or restriction digest analysis.

Quality Control

Performance of Yeastern Agarose Standard is tested to satisfy set specifications in these criteria: appearance, DNase & RNase assay, water content, gel strength, gelling temperature, melting temperature, sulfate content, and electroendosmosis. It is also tested for DNA recovery.

Results



Lane 1: Marker 1 (λ/*Hind* III digest)
Lane 2: Marker 2 (λ/*Hind* III • *Eco*R I double digest)
Lane 3: Marker 3 (λ/*Hind* III+ λ/*Eco*R I digest mixture)
Lane 4: Marker 6 (λ/*Sty* I digest)

RT

 # FYA002-100G
Agarose Standard 100 g

 # FYA002-500G
Agarose Standard 500 g

Related Products

- YEA Ladder DNA Markers 1-11
- EtB"Out" Nucleic Acid Staining Solution 1-12
- Agarose Standard 1-13
- O' in 1 DNA Polymerase Premix 2-3
- RealStart DNA Polymerase Premix 2-9
- EZtime Real-Time PCR Premix 2-11
- ECOS™ Competent Cells 3-1
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

Note

PCR, RT-PCR & dNTPs

*YEA*taq DNA Polymerase

-20°C

 # FYT001-500U (500 units)

*YEA*taq DNA Polymerase (2.5 U/µl)	100 µl
10× Reaction Buffer	2 ml
dNTPs Mix (10 mM)	200 µl

 # FYT011-500U (500 units)

*YEA*taq DNA Polymerase (2.5 U/µl)	100 µl
10× Reaction Buffer	2 ml

Storage Buffer

50 mM Tris-HCl (pH 9.0), 100 mM NaCl, 0.1 mM EDTA, 1% Triton X-100, 5 mM DTT, 50% Glycerol, Stabilizers

10× Reaction Buffer*

100 mM KCl, 20 mM $MgSO_4 \cdot 7H_2O$, 200 mM Tris-HCl (pH 8.8), 1% Triton X-100, 100 mM $(NH_4)_2SO_4$, 1 mg/ml BSA

* The reaction buffer is supplied as a 10× concentrate and should be diluted for use.

Related Products

- UniversAll™ Tissue Extraction/ PCR kit 1-1
- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- dNTPs 2-22

Description

*YEA*taq DNA Polymerase is a thermostable enzyme derived from the thermophilic bacterium *Thermus aquaticus*. It is able to withstand repeated heating to 95°C without significant loss of activity. The enzyme catalyzes 5'→3' synthesis of DNA, has no detectable proofreading 3'→5' exonuclease activity and possesses low 5'→3' exonuclease activity. It also exhibits deoxynucleotidyl transferase activity, which normally results in the addition of extra adenines at the 3'-end of PCR products, required for the DNA ligation to TA vector.

Yeastern Biotech offers *YEA*taq DNA Polymerase in two different packages: one with dNTPs mix and the other without.

The enzyme is in a recombinant form expressed in *E. coli*.

Features

- **Thermostable :** half life is more than 40 min at 95°C.
- 10× Reaction Buffer is supplied with two components: KCl and $(NH_4)_2SO_4$, the latter allows for PCR at wide range of magnesium concentrations and decreases non-specific priming.
- Incorporates modified nucleotides (e.g., dUTP, dITP, biotin-, digoxigenin-, fluorescently-labeled nucleotides).
- The error rate of *YEA*taq DNA Polymerase in PCR is 2×10^{-5} errors per nucleotide per cycle.

Applications

- Cloning
- Screening
- Primer extension
- Terminal dA tailing
- Routine PCR amplification of DNA fragments up to 3 Kb
- DNA labeling
- DNA sequencing

Unit Definition

One unit is defined as the amount of enzyme that will incorporate 10 nmol of dNTPs into acid-insoluble material in 30 minutes at 72°C.

Quality Control

- Nuclease activity is not detected after incubation of 1 µg λ/*Hind* III DNA with 5 units of *YEA*taq DNA polymerase in 50 µl reaction buffer for 18 hours at 37 °C.
- The absence of endo-, exodeoxyribonucleases and ribonucleases is confirmed by appropriate tests. Functional test is performed by PCR.

Patterns/Disclaimer

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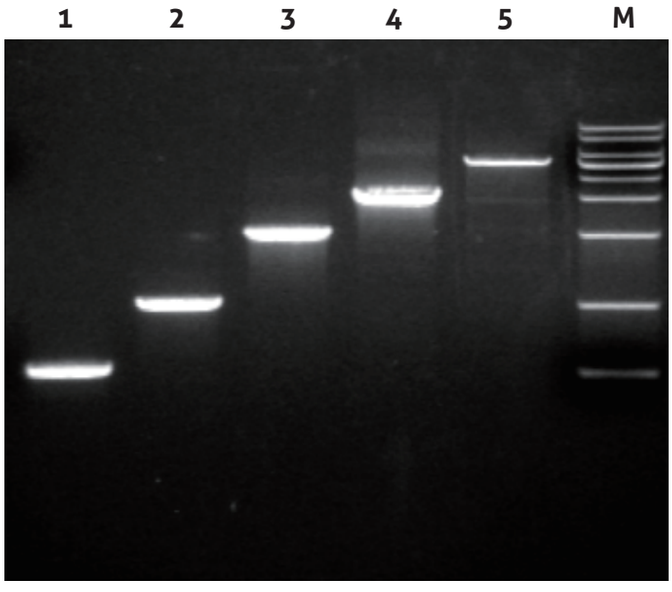
Results



Amplification of PCR fragments in different sizes using *YEA*taq DNA Polymerase:

Lane 1: 0.5 kb;
Lane 2: 1 kb;
Lane 3: 2 kb;
Lane 4: 3 kb;
Lane 5: 5 kb;
Lane M: 1 kb DNA ladder.

O' in 1 DNA Polymerase Premix

-20°C

 # FYT201-100P (100 preps)
O' in 1 DNA Polymerase Premix (1×) 100 µl

 # FYT202-100P (100 preps)
O' in 1 DNA Polymerase Premix (2×) 1.25 ml x 2

1× O'in 1 DNA Polymerase Premix
10 mM KCl , 2 mM $MgSO_4 \cdot 7H_2O$, 20 mM Tris-HCl (pH 8.8), 0.1% Triton X-100, 10 mM $(NH_4)_2SO_4$, 0.1 mg/ml BSA, 0.2 mM dNTP mix, 50 U/ml *YEA*taq DNA Polymerase, stabilizers.

2× O'in 1 DNA Polymerase Premix
Two folds of all the above reagents

Description

O' in 1 DNA Polymerase Premix is an economical and ready-to-use premix, containing *YEA*taq DNA Polymerase **(# FYT001-500U)**, dNTP and all other reagents necessary for PCR, except DNA template and primers. It saves the time for preparing the master mix and reduces the risk of contamination from multiple pipetting steps. O' in 1 2× DNA Polymerase Premixes are also available with different non-interfering dyes for applications when loading dyes are desired. Users can choose from 5 different colors, including red, orange (mix of red and orange), violet, green (mix of blue and orange), and blue, depending on the preferred dye locations on the gel.

Optimal PCR conditions, including template and primer concentrations and PCR program, for gene of interest should be determined experimentally by the investigator from case to case.

Features

- **Convenient :** *taq* DNA polymerase in a ready-to-use mix with or without dyes
- **Reproducible :** lower contamination and pipetting error risk

Applications

- Ready to use
- Master mix
- Suitable for economic screening
- High throughput PCR
- Routine PCR with high reproducibility
- Generation of PCR products for TA cloning

Unit Definition

One unit is defined as the amount of enzyme that will incorporate 10 nmol of dNTPs into acid-insoluble material in 30 minutes at 72°C.

Size of Dye (in 1% agarose gel)

- Red : ~700 bp
- Yellow : ~50 bp
- Blue : ~4000 bp
- Violet : ~400 bp

Quality Control

- Nuclease activity is not detected after incubation of 1 µg λ/*Hind* III DNA with 5 units of HiFi DNA Polymerase in 50 µl reaction buffer for 18 hours at 37 °C.
- The absence of endo-, exodeoxyribonucleases and ribonucleases is confirmed by appropriate tests. Functional test is performed by PCR.

Patterns/Disclaimer

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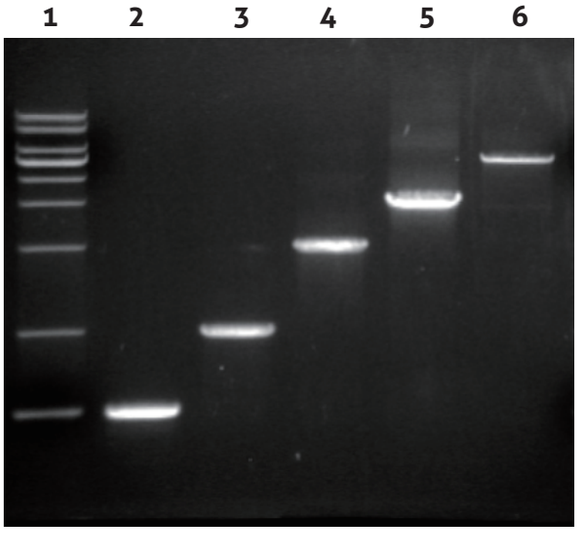
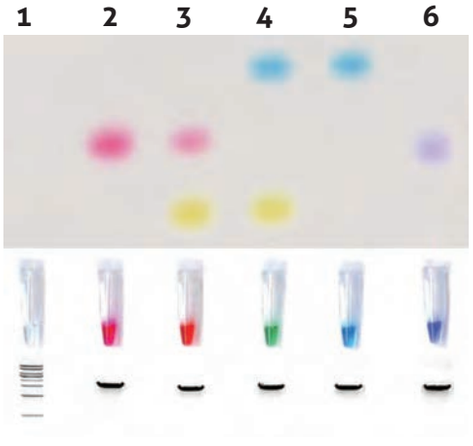
Results



Amplification of PCR fragments in different sizes using O' in 1 DNA Polymerase Premix:

Lane 1: 1 kb DNA ladder;
Lane 2: 0.5 kb;
Lane 3: 1 kb;
Lane 4: 2 kb;
Lane 5: 3 kb;
Lane 6: 5 kb.



Amplification of a 2 kb PCR fragments using O' in 1 DNA polymerase premix with different colors of dyes:

Lane 1: marker;
Lane 2: red;
Lane 3: orange (red+yellow);
Lane 4: green (yellow+blue);
Lane 5: blue;
Lane 6: violet.

4°C

 # FYT203-100P
O' in 1 DNA Polymerase Premix (2×) with Red Dye — 1.25 ml x 2

 # FYT204-100P
O' in 1 DNA Polymerase Premix (2×) with Orange Dye — 1.25 ml x 2

 # FYT205-100P
O' in 1 DNA Polymerase Premix (2×) with Green Dye — 1.25 ml x 2

 # FYT206-100P
O' in 1 DNA Polymerase Premix (2×) with Blue Dye — 1.25 ml x 2

 # FYT207-100P
O' in 1 DNA Polymerase Premix (2×) with Violet Dye — 1.25 ml x 2

Related Products

- UniversAll™ Tissue Extraction/ PCR kit 1-1
- UniversAll™ Extraction Buffer 1-1
- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- dNTPs 2-22
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

Accu DNA Polymerase

-20°C

 # FYT004-500U (500 units)

Accu DNA Polymerase	100 µl (5 U/µl)
10× Reaction Buffer	2 ml
dNTPs Mix	200 µl (10 mM)

 # FYT044-500U (500 units)

Accu DNA Polymerase	100 µl (5 U/µl)
10× Reaction Buffer	2 ml

 # FYT401-100P (100 preps)

Accu DNA Polymerase	1.25 ml x 2
Premix (2×) with Green dye	

Storage Buffer

50 mM Tris-HCl (pH 9.0), 100 mM NaCl, 0.1 mM EDTA, 1% Triton X-100, 5 mM DTT, 50% Glycerol, Stabilizers

10× Reaction Buffer*

100 mM KCl, 20 mM $MgSO_4 \cdot 7H_2O$, 200 mM Tris-HCl (pH 8.8), 1% Triton X-100, 100 mM $(NH_4)_2SO_4$, 1 mg/ml BSA

* The reaction buffer is supplied as a 10× concentrate and should be diluted for use.

Related Products

- UniversAll™ Tissue Extraction/PCR kit 1-1
- UniversAll™ Extraction Buffer 1-1
- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- dNTPs 2-22
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

Description

Accu DNA Polymerase is purified from an *E. coli* strain carrying a plasmid with a cloned gene encoding a *Pyrococcus Sp.* DNA polymerase. The enzyme catalyzes the incorporation of nucleotides into dsDNA in the 5'→3' direction in the presence of Mg^{2+} at 70 ~ 80°C. Accu DNA Polymerase exhibits 3'→5' exonuclease (proofreading) activity, but has no detectable 5'→3' exonuclease activity. dUTP, dITP and primers containing these nucleotides should not be used in PCR with Accu DNA polymerase because they inhibit DNA synthesis.

Accu DNA Polymerase in two different packages is offered by Yeastern Biotech, one with dNTPs mix and the other without. A PCR premix format is also available with or without a green dye.

Features

- The error rate of Accu DNA polymerase in PCR is 2.6×10^{-6} errors per nucleotide per cycle.
- Eight times more accurate than *Taq* DNA polymerase.
- Highly thermostable: remains 95% activity after 2 hours incubation at 95°C.
- Generates blunt-end PCR products.
- Incorporates modified nucleotides (e.g., biotin-, digoxigenin-, fluorescently-labeled nucleotides).

Applications

- Cloning
- Amplification
- Mutation analysis
- Accurate polymerization
- Routine PCR amplification of DNA fragments up to 3 kb
- RT-PCR
- Blunt end amplification products

Unit Definition

One unit is defined as the amount of enzyme that will incorporate 10 nmol of dNTPs into acid-insoluble material in 30 minutes at 72 °C.

Quality Control

- Nuclease activity is not detected after incubation of 1 µg λ/*Hind* III DNA with 5 units of Accu DNA polymerase in 50 µl reaction buffer for 18 hours at 37 °C.
- The absence of endo-, exodeoxyribonucleases and ribonucleases is confirmed by appropriate tests. Functional test is performed by PCR.

Patterns/Disclaimer

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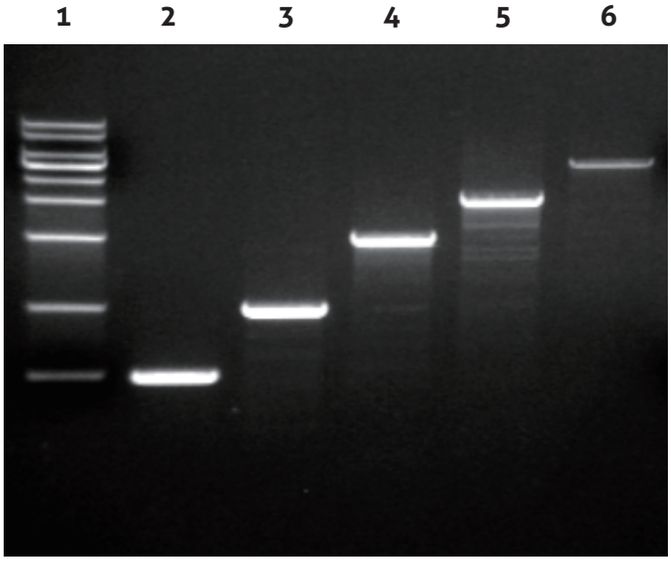
Results



Amplification of PCR fragments in different sizes using Accu DNA Polymerase:

Lane 1: 1 kb DNA ladder;
Lane 2: 0.5 kb;
Lane 3: 1 kb;
Lane 4: 2 kb;
Lane 5: 3 kb;
Lane 6: 5 kb.

HiFi DNA Polymerase

-20°C

 # FYT003-500U (500 units)

HiFi DNA Polymerase	100 µl (5 U/µl)
10× Reaction Buffer	2 ml
dNTPs Mix	200 µl (10 mM)

 # FYT033-500U (500 units)

HiFi DNA Polymerase	100 µl (5 U/µl)
10× Reaction Buffer	2 ml

Storage Buffer

50 mM Tris-HCl (pH 9.0), 100 mM NaCl, 0.1 mM EDTA, 1% Triton X-100, 5 mM DTT, 50% Glycerol, Stabilizers

10× Reaction Buffer*

100 mM KCl, 20 mM $MgSO_4 \cdot 7H_2O$, 200 mM Tris-HCl (pH 8.8), 1% Triton X-100, 100 mM $(NH_4)_2SO_4$, 1 mg/ml BSA

* The reaction buffer is supplied as a 10× concentrate and should be diluted for use.

Related Products

- UniversAll™ Tissue Extraction/PCR kit 1-1
- UniversAll™ Extraction Buffer 1-1
- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- dNTPs 2-22
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

Description

HiFi DNA polymerase is ideal for amplification of DNA fragments that require high-fidelity. High fidelity is achieved by an optimal blend of high performance *YEA*taq DNA polymerase and Accu DNA polymerase, a *Pyrococcus* proofreading (3'→5' exonuclease activity) enzyme. This formulation achieves greater yields with higher fidelity than standard DNA polymerases such as *Taq*. HiFi is a quality choice for sensitive applications. Because of the presence of Accu DNA polymerase in the blend, dUTP, dITP and primers containing these nucleotides should not be used in PCR because they hinder DNA synthesis.

HiFi DNA polymerase is offered in two different packages, one with dNTPs mix and the other without. HiFi DNA Polymerase is also available in 2× ready-to-use premix format with a green dye.

Features

- Robust amplification with minimal optimization.
- High yields of PCR products.
- Higher sensitivity compared to conventional *Taq* DNA Polymerase.
- Amplification of long targets up to 6 kb from genomic DNA.
- Generates 3'-dA overhangs.
- Incorporates modified nucleotides.
- The error rate of HiFi DNA Polymerase in PCR is 8.3×10^{-6} errors per nucleotide per cycle.

Applications

- Cloning and expression
- Blunt end amplification products
- Mutation analysis
- Efficient & highly sensitive PCR use
- Routine PCR amplification of DNA fragments up to 6 kb from genomic DNA
- RT-PCR

Unit Definition

One unit is defined as the amount of enzyme that will incorporate 10 nmol of dNTPs into acid-insoluble material in 30 minutes at 72 °C.

Quality Control

- Nuclease activity is not detected after incubation of 1 µg λ/*Hind* III DNA with 5 units of HiFi DNA polymerase in 50 µl reaction buffer for 18 hours at 37 °C.
- The absence of endo-, exodeoxyribonucleases and ribonucleases is confirmed by appropriate tests. Functional test is performed by PCR.

Patterns/Disclaimer

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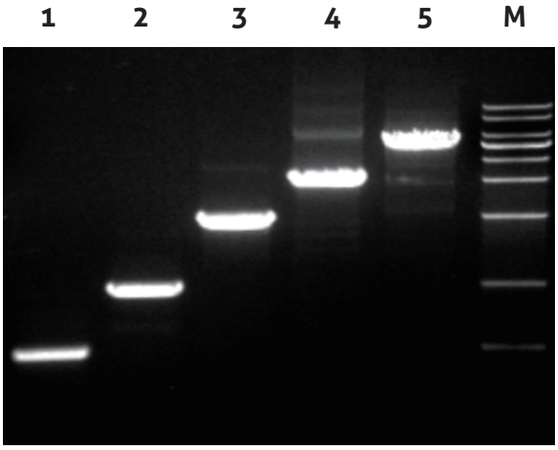
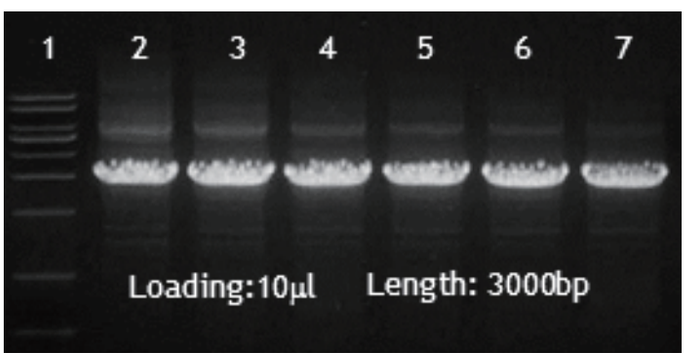
Results



Amplification of PCR fragments in different sizes using HiFi DNA Polymerase:

Lane 1: 0.5 kb;
Lane 2: 1 kb;
Lane 3: 2 kb;
Lane 4: 3 kb;
Lane 5: 5 kb;
Lane M: 1 kb DNA ladder.

High Efficiency, as fast as 1 kb/5 Secs!



Lane 1: 1 kb DNA Marker **(#FYD001-500UL)**
Lane 2: 72°C 180 secs (60 sec/kb)
Lane 3: 72°C 120 secs (40 sec/kb)
Lane 4: 72°C 60 secs (20 sec/kb)
Lane 5: 72°C 45 secs (15 sec/kb)
Lane 6: 72°C 30 secs (10 sec/kb)
Lane 7: 72°C 15 secs (5 sec/kb)

RealStart DNA Polymerase Premix

-20°C

 # FYT101-100P (100 preps)

2× RealStart DNA Polymerase Premix (w/o loading dye)	1.25 ml 0.1 U/µl

 # FYT102-100P (100 preps)

2× RealStart DNA Polymerase Premix (w/ loading dye)	1.25 ml 0.1 U/µl

Premix contains:

- Hotstart Taq DNA polymerase
- dNTPs mix (including dATP, dCTP, dGTP, dTTP)
- 7.5 mM $MgCl_2$
- Loading dye (including bromophenol blue)

Related Products

- UniversAll™ Tissue Extraction/PCR kit 1-1
- UniversAll™ Extraction Buffer 1-1
- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- dNTPs 2-22
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

Description

RealStart DNA Polymerase premix is an ultra-sensitive and convenient PCR premix product. It contains 2× concentrated solution of HotStart DNA polymerase, dNTPs, optimized buffers, and loading dye (optional) needed for PCR. The only step it takes to perform PCR with RealStart DNA Polymerase premix is to add DNA template and primers into the reaction mix. Since special HotStart DNA polymerase in the premix is activated after heating, it greatly reduces non-specific amplification when working with the premix at room temperature.

Features

- **Simple & time-saving :** Just add templates of interest and primers into the RealStart DNA Polymerase Premix.
- **Less Contamination :** Reduce non-specific amplification caused by mispriming events that occur during setup and initial temperature increase.
- **High Sensitivity :** tested in amplification of a single gene copy.
- **Convenient :** An excellent tool when working with high quantities of samples.
- **Sample Size :** work excellent for short DNA templates (size shorter than 600 bp).

Applications

- High throughput hot-start PCR.
- RT-PCR.
- Highly specific amplification of complex genomic and cDNA templates.
- Amplification of low copy DNA targets.
- Generation of PCR products for TA cloning.

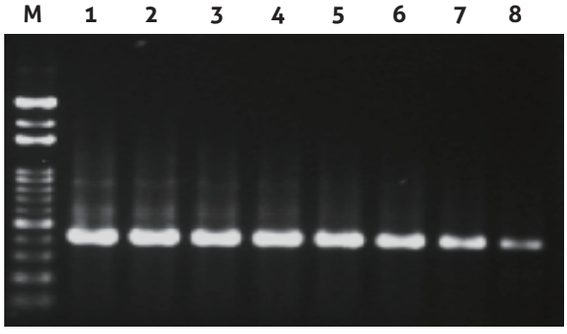
Unit Definition

One unit is defined as the amount of enzyme that will incorporate 10 nmol of dNTPs into acid-insoluble material in 30 minutes at 72 °C.

Quality Control

- Nuclease activity is not detected after incubation of 1 µg λ/*Hind* III DNA with 5 units of RealStart DNA polymerase in 50 µl reaction buffer for 18 hours at 37 °C.
- The absence of endo-, exodeoxyribonucleases and ribonucleases is confirmed by appropriate tests. Functional test is performed by PCR.

Results



High sensitivity for low copy genes!

Template: pUC18
1 mg pUC18 DNA = 3.4 x10^{11} molecules

Lane M: 1 kb DNA Marker **(#FYD001-500UL)**
Lane 1: 3 x10^{7} molecules **Lane 2:** 3 x10^{6} molecules
Lane 3: 3 x10^{5} molecules **Lane 4:** 3 x10^{4} molecules
Lane 5: 3 x10^{3} molecules **Lane 6:** 3 x10^{2} molecules
Lane 7: 3 x10^{1} molecules **Lane 8:** 3 molecules

EZtime Fast Real-Time PCR Premix

Description

EZtime Fast Real-Time PCR Premix for SYBR® Green **(#FYT108-100P/400P)** is a ready-to-use, 2× concentrated premix reagent, containing all components except primers and template. It is formulated with a novel hot start Taq DNA polymerase, which is capable of catalyzing DNA amplification in a fast PCR mode. This special blend greatly shortens the running time of real-time quantitative PCR by around 1 hour when compared to traditional qPCR. In addition, it precisely meets current researchers' needs for performing gene detection (qPCR) and quantification of gene expression (2-step qRT-PCR) in a high speed and/or high-throughput manner in addition to those basic requirements of high sensitivity, wide dynamic range, and good reproducibility.

EZtime Fast Real-Time PCR Premix for TaqMan® Probe **(#FYT110-100P/400P)** is a ready-to-use, 2× concentrated premix reagent, containing all components except primers, probe, and template. It is formulated with a novel hot-start Taq DNA polymerase, which is capable of catalyzing DNA amplification in a fast PCR mode. This special blend greatly shortens the running time of real-time quantitative PCR by around 1 hour when compared to traditional qPCR. In addition, it precisely meets current researchers' needs for performing gene detection (qPCR) and quantification of gene expression (2-step qRT-PCR) in a high speed and/or high-throughput manner in addition to those basic requirements of high sensitivity, wide dynamic range, and good reproducibility.

Features

- **Fast :** shortens the running time of real-time quantitative PCR by around 1 hour
- **Specificity :** Hotstart Taq and the optimized buffer eliminates non-specific amplification and formation of primer dimers
- **Sensitivity :** detects low copy number targets
- **Wide linear range :** accurate quantification across 9 orders of magnitude
- **Reproducibility and convenience :** ready-to-use 2× master mix minimizes pipetting error and reduces set-up time

Applications

- Quantitative real-time PCR
- Quantitative 2-step RT-PCR
- Quick and accurate detection and quantification of target gene through real-time PCR

Quality Control

- Error<0.01, 2.1>Efficiency>1.90, ΔCP<1
- The absence of endo-, exodeoxyribonucleases and ribonucleases is confirmed by appropriate quality tests. Functionally tested in qPCR for specificity, sensitivity and reproducibility using serial dilutions of control genomic DNA template.

-20°C

 # FYT108-100P (100 preps)
EZtime Fast Real-Time PCR Premix (2×, SYBR Green, ROX) 1 ml

 # FYT108-400P (400 preps)
EZtime Fast Real-Time PCR Premix (2×, SYBR Green, ROX) 1 ml x 4

 # FYT110-100P (100 preps)
EZtime Fast Real-Time PCR Premix (2×, TaqMan, ROX) 1 ml

 # FYT110-400P (400 preps)
EZtime Fast Real-Time PCR Premix (2×, TaqMan, ROX) 1 ml x 4

Premix contains:

- Hotstart Taq DNA polymerase
- SYBR Green real-time PCR Buffer
- dNTP mix including dATP, dCTP, dGTP, dTTP
- 5 mM $MgCl_2$

Related Products

- UniversAll™ Tissue Extraction/PCR kit 1-1
- UniversAll™ Extraction Buffer 1-1
- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- dNTPs 2-22
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

EZtime Real-Time PCR Premix

-20°C

 # FYT103-100P (100 preps)
EZtime Real-Time PCR Premix (2×, SYBR Green) 1.25 ml

 # FYT103-400P (400 preps)
EZtime Real-Time PCR Premix (2×, SYBR Green) 1.25 ml x 4

 # FYT104-100P (100 preps)
EZtime Real-Time PCR Premix (2×, SYBR Green, ROX) 1.25 ml

 # FYT104-400P (400 preps)
EZtime Real-Time PCR Premix (2×, SYBR Green, ROX) 1.25 ml x 4

 # FYT105-100P (100 preps)
EZtime Real-Time PCR Premix (2×, TaqMan) 1.25 ml

 # FYT105-400P (400 preps)
EZtime Real-Time PCR Premix (2×, TaqMan) 1.25 ml x 4

 # FYT106-100P (100 preps)
EZtime Real-Time PCR Premix (2×, TaqMan, ROX) 1.25 ml

 # FYT106-400P (400 preps)
EZtime Real-Time PCR Premix (2×, TaqMan, ROX) 1.25 ml x 4

Premix contains:

- Hotstart Taq DNA polymerase
- SYBR Green real-time PCR Buffer
- dNTP mix including dATP, dCTP, dGTP, dTTP
- 5 mM $MgCl_2$

Related Products

- UniversAll™ Tissue Extraction/PCR kit 1-1
- UniversAll™ Extraction Buffer 1-1
- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- dNTPs 2-22
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

Description

The EZtime Real-Time PCR Premix **(# FYT103-100P or # FYT104-100P)** is a ready-to-use, 2× concentrated PCR premix, including Hotstart Taq, SYBR Green I, optimized reaction buffer and nucleotides **(# FYT104-100P with ROX)** for running quantitative real-time PCR, including qPCR and 2-step qRT-PCR, in the SYBR Green I detection format. SYBR Green Premix provides high sensitivity, wide dynamic range and reproducibility for quantification.

The EZtime Real-Time PCR Premix **(# FYT105-100P or # FYT106-100P)** is a ready-to-use, 2× concentrated PCR premix that contains all reagents (except for primers, probe and template) needed for running real-time PCR **(# FYT106-100P with ROX)**. Real-time PCR is performed by addition of various probes, such as TaqMan, Molecular Beacon, etc. This product combines the high performance Hotstart Taq with a buffer which provides good specificity, amplification efficiency for real-time PCR.

Features

- **Specificity :** Hotstart Taq and the optimized buffer eliminates non-specific amplification and formation of primer dimers
- **Sensitivity :** detects low copy number targets
- **Wide linear range :** accurate quantification across 9 orders of magnitude
- **Reproducibility and convenience :** ready-to-use 2× master mix minimizes pipetting error and reduces set-up time

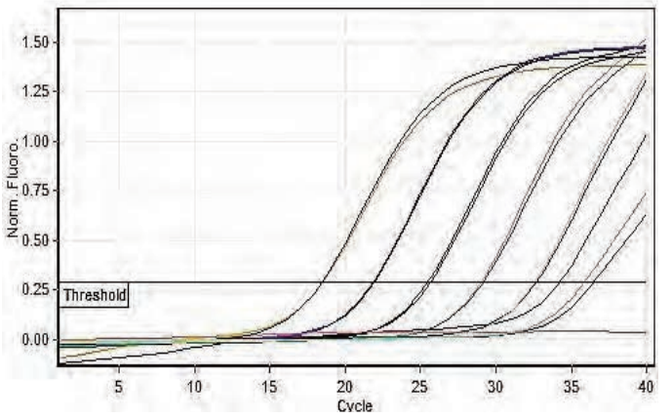
Applications

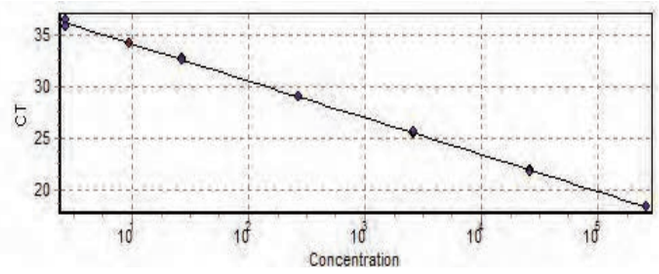
- Quantitative real-time PCR
- Quantitative 2-step RT-PCR
- Quick and accurate detection and quantification of target gene through real-time PCR

Quality Control

- Error<0.01, 2.1>Efficiency>1.90, ΔCP<1
- The absence of endo-, exodeoxyribonucleases and ribonucleases is confirmed by appropriate quality tests. Functionally tested in qPCR for specificity, sensitivity and reproducibility using serial dilutions of control genomic DNA template.

Results





Primers were designed to amplify a specific region of YB T&A™ Vector that has been serially diluted to different concentrations.

Selection Guide of YB DNA Polymerases

Cat #	Item Name	PCR Length	Sensitivity	Accuracy	A-tail	Time Saving	Features and Applications
FYT001 FYT011	YEAtaq DNA Polymerase	++	++	+	+++	+	Cost-effective TA cloning For general use
FYT003 FYT033	HiFi DNA Polymerase	+++	++	++	+	+	Long PCR, high yield, higher fidelity than *YEA*taq
FYT004 FYT044	Accu DNA Polymerase	++	+	+++	X	+	Proof-reading activity, low mutation rates, 100% amplification accuracy, suitable for gene cloning
FYT101 FYT102	RealStart Taq Premix	+	+++	+	++	+	Low copy (3-5 copies) gene detection with PCR products < 600 bp. Suitable for diagnostic analysis
FYT103 FYT104 FYT105 FYT106	EZtime Real-Time PCR Premix	+	+++	+	++	+	Real-time gene quantification, gene expression analysis, high sensitivity, detection of low copy (1 copy) gene. PCR products <300 bp are recommended.
FYT108 FYT110	EZtime Fast Real-Time PCR Premix	+	+++	+	++	+++	Shortens the running time of real-time quantitative PCR by around 1 hour

Direct PCR Kits for Blood/Plants

-20°C

Direct PCR Kit for Blood

 # FYT302-100P (100 preps)

2× Premix	1.25 ml
HiFi DNA Polymerase	50 µl
Enhancer B1	200 µl
Enhancer B2	200 µl
Universal Primer Set	100 µl

Direct PCR Kit for Plants

 # FYT303-100P (100 preps)

2× Premix	1.25 ml
HiFi DNA Polymerase	50 µl
Enhancer P1	200 µl
Enhancer P2	200 µl
Universal Primer Set	100 µl

Related Products

- UniversAll™ Tissue Extraction/PCR kit 1-1
- UniversAll™ Extraction Buffer 1-1
- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- dNTPs 2-22
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

Description

YB Direct PCR Kits for Blood/Plants are formulated to perform PCR directly from whole blood or plant leaf tissues with no prior DNA extraction. The Direct PCR for Blood can process whole blood preserved in EDTA, citrate or heparin or stored on various types of filter papers. Plant tissues even with high polyphenolic compounds are all suitable for Direct PCR for Plants. The Kits employs our especial mixes of DNA polymerases and reagents allowing higher resistance to inhibitors found in blood and plants, respectively.

The Blood Direct PCR kit has been optimized to give excellent results with blood originated from many animals. The recommended blood concentration is 1–10 % and the recommended plant leaf tissue size is about 2 mm^2. YB Direct PCR Kits includes a pair of universal control primers that are compatible with a number of mammalian and plant species, respectively.

Features

- No need to purify DNA prior to PCR
- Minimizes the risk of DNA contamination during reagent handling
- Minute sample material required

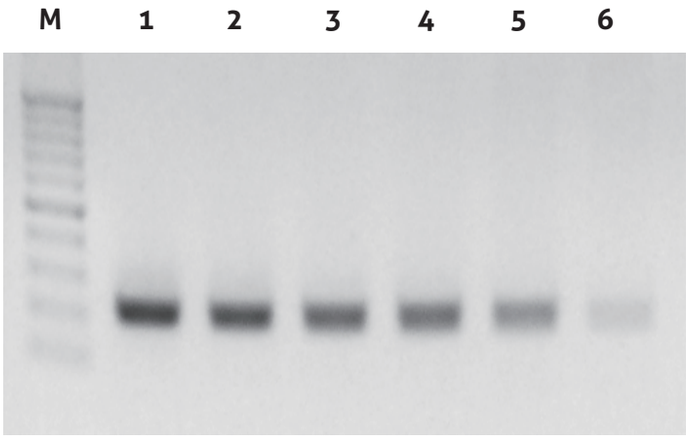
Applications

- Molecular diagnostic test
- Forensic DNA Analysis
- Identity testing
- Multiplex PCR / SNP detection / PCR-RFLP
- DNA sequencing / Cloning
- Laboratory automatic PCR
- Quantitative PCR
- Genotyping

Quality Control

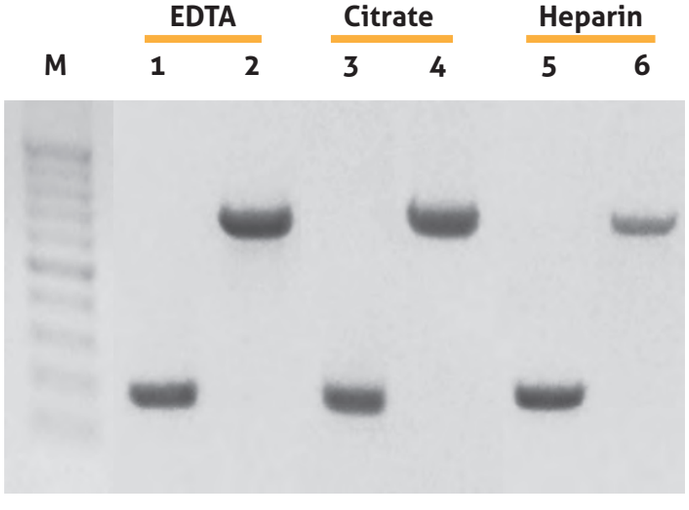
The performances of YB Direct PCR kits are tested in PCR reaction using human blood and plant with universal primer sets. The sensitivities of the kits are verified by the detection of specific sizes of products by DNA agarose gel and DNA sequencing.

Results



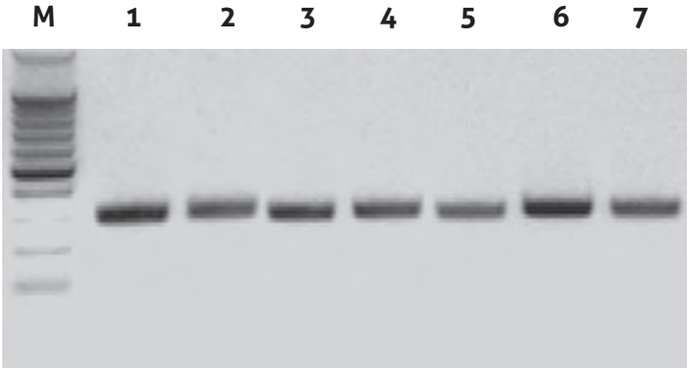
PCR results by using Direct PCR Kit for Blood. Direct PCR was performed by amplifying a genomic DNA fragment with increasing blood concentration in the reaction mixture.

Lane M: marker;
Lane 1: 2% Human Blood with Heparin (v/v);
Lane 2: 4% Human Blood with Heparin (v/v);
Lane 3: 8% Human Blood with Heparin (v/v);
Lane 4: 12% Human Blood with Heparin (v/v);
Lane 5: 16% Human Blood with Heparin (v/v);
Lane 6: 20% Human Blood with Heparin (v/v).



PCR results by using Direct PCR Kit for Blood. Amplification of a 376 bp and a 1.2 kb DNA fragment from human blood preserved with EDTA, citrate, or heparin (8 % blood in the reaction).

Lane M: marker;
Lane 1: 376 bp DNA fragment;
Lane 2: 1.2 kb DNA fragment;
Lane 3: 376 bp DNA fragment;
Lane 4: 1.2 kb DNA fragment;
Lane 5: 376 bp DNA fragment;
Lane 6: 1.2 kb DNA fragment.



PCR results by using Direct PCR Kit for Plant. Direct PCR was performed by amplifying a genomic DNA fragment from leaf tissues of different plant species.

Lane M: marker;
Lane 1: Wheatgrass (*Triticum aestivum*);
Lane 2: Orchid (*Phalaenopsis*);
Lane 3: Rockcress (*Arabidopsis thaliana*);
Lane 4: Giant Miscanthus (*Miscanthus floridulus*);
Lane 5: Passion fruit (*Passiflora edulis*);
Lane 6: Papaya (*Carica papaya*);
Lane 7: Pothos (*Epipremnum aureum*).

Deoxy+ HiSpec Reverse Transcriptase

-20°C

 # FYT501-100R (100 rxns)

Deoxy+ HiSpec Reverse Transcriptase (20000 U)	50 µl x 2
2× Deoxy+ RT Premix*	0.5 ml x 2

(2× Deoxy+ RT Premix contains RT buffer, 0.1 M DTT and 10 mM dNTPs)*

Description

Deoxy+ HiSpec Reverse Transcriptase (RT) is genetically engineered by introducing of point mutations to MMLV RT that increase half-life, reduce RNase activity and increase thermal stability. Those designed mutations lead to increased specificity of Deoxy+ HiSpec RT and the highest cDNA yield of all RTs. It is ideal for RT-PCR of a specific gene or generating cDNA from total or poly (A)+ RNA samples. It synthesizes a complementary DNA strand from total RNA, mRNA, or an RNA:DNA hybrid.

Features

- Half life of 100 minutes at 50°C for the highest cDNA yields
- Reduced RNase H activity for more full-length cDNA
- Full activity at 50°C for increased specificity with GSP
- Ability to increase RT units without inhibiting subsequent PCR

Applications

- Synthesis of first-strand cDNA
- Array labeling
- cDNA libraries
- RT-PCR, primer extension, and 3′ and 5′ RACE

Unit Definition

One unit incorporates 1 nmole of dTTP into acid precipitable material in 10 minutes at 37°C using poly(A)-oligo(dT) as template primer.

Quality Control

This product has passed the following quality control assays: SDS-polyacrylamide gel analysis for purity; functional absence of endodeoxyribonuclease, 3′ and 5′ exodeoxyribonuclease, and ribonuclease activities; yield and length of cDNA product.

Related Products

- Genomic DNA Extraction Kit (Tissue) 2.0 1-6
- Genomic DNA Extraction Kit (Plant) 2.0 1-6
- miRNA Isolation Kit 2.0 1-10
- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- *YEA*taq DNA Polymerase 2-1
- Accu DNA Polymerase 2-5
- HiFi DNA Polymerase 2-7
- EZtime Real-Time PCR Premix 2-11
- Deoxy+ OneStep RT-PCR Kit 2-16
- Deoxy+ Real-Time SYBR Green RT-PCR Kit 2-17
- Deoxy+ Real-Time TaqMan RT-PCR Kit 2-18
- Direct RT-PCR Kit 2-19
- dNTPs 2-22
- ECOS™ Competent Cells 3-1
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

Deoxy+ OneStep RT-PCR Kit

Description

The Deoxy+ OneStep RT-PCR Kit is a ready-to-use master mix, which eliminates the need for optimization of reaction and cycling conditions for one-step RT-PCR. The reaction can be prepared by simply adding template RNA and primersto the master mix. The use of Yeastern's Hotstart DNA polymerase and Deoxy+ HiSpec RT enables reliable real-time RT-PCR quantification on any real-time PCR machines. Since it is a one-tube reaction, the procedure makes high-throughput analysis possible.

After reverse transcription, reactions are heated to 95°C for 10 minutes to inactivate the reverse transcriptase and simultaneously activate HotStart Taq DNA polymerase. This hot start to the PCR eliminates any nonspecific amplification products such as primer-dimers and reduces background smear, ensuring highly sensitive and reproducible RT-PCR.

Features

- Fast and easy one-tube setup
- One-step RT-PCR of any RNA template without optimization
- Unique enzyme mix for high specificity and sensitivity
- Optimized reverse-transcription and amplification buffer

Applications

- Onestep RT-PCR
- Gene-expression analysis

Quality Control

The performance of Deoxy+ OneStep RT-PCR Kit is tested in an RT reaction using human embryonic kidney cell lysate with primer d(T)20. The sensitivity of the kit is verified by the detection of B2M transcript after 40 cycles. The length of cDNA achieved is verified by detection of a 248 bp by DNA agarose gel and DNA sequencing.

-20ºC

 # FYT503-50P (50 preps)

2× Deoxy+ OneStep RT PCR Premix	0.625 ml
Sterilized ddH_2O	1 ml

 # FYT503-100P (100 preps)

2× Deoxy+ OneStep RT PCR Premix	0.625 ml x 2
Sterilized ddH_2O	1 ml x 2

Related Products

- Genomic DNA Extraction Kit (Tissue) 2.0 1-6
- Genomic DNA Extraction Kit (Plant) 2.0 1-6
- miRNA Isolation Kit 2.0 1-10
- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- *YEA*taq DNA Polymerase 2-1
- Accu DNA Polymerase 2-5
- HiFi DNA Polymerase 2-7
- EZtime Real-Time PCR Premix 2-11
- Deoxy+ Hispec Reverse Transcriptase 2-15
- Deoxy+ Real-Time SYBR Green RT-PCR Kit 2-17
- Deoxy+ Real-Time TaqMan RT-PCR Kit 2-18
- Direct RT-PCR Kit 2-19
- dNTPs 2-22
- ECOS™ Competent Cells 3-1
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

Deoxy+ Real-time SYBR Green RT-PCR Kit

-20°C

 # FYT504-50P (50 preps)

2× Deoxy+ Real-time SYBR Green RT PCR Premix, ROX	0.625 ml
Sterilized ddH_2O	1 ml

 # FYT504-100P (100 preps)

2× Deoxy+ Real-time SYBR Green RT PCR Premix, ROX	0.625 ml x 2
Sterilized ddH_2O	1 ml x 2

Description

Deoxy+ Real-time SYBR Green RT-PCR system provides users with a rapid and simple way to quantify the expression of gene of interest based on Real-time PCR system containing SYBR Green. Yeastern's Deoxy+ HiSpec RT, Hotstart DNA polymerase and all the components for Real-time SYBR Green RT-PCR are skillfully mixed within a single tube. Unique buffer system allows highly specific quantification by preventing the formation of nonspecific products and primer–dimers.

Features

- Ready-to-use master mix to allow faster setup, maximize throughput and reduce the contamination risk of real-time RT-PCR analysis
- Detection of even low copy numbers
- Excellent sensitivity and easy optimization with SYBR Green

Applications

- Validation of siRNA-mediated gene knockdown
- Detection of gene regulation

Quality Control

The performance of Deoxy+ Real-time SYBR Green RT-PCR Kit is tested in an RT reaction using human embryonic kidney cell lysate with primer $d(T)_{20}$. The sensitivity of the kit is verified by the detection of B2M transcript after 40 cycles. The length of cDNA achieved is verified by detection of a 248 bp by DNA agarose gel and DNA sequencing.

Related Products

- Genomic DNA Extraction Kit (Tissue) 2.0 1-6
- Genomic DNA Extraction Kit (Plant) 2.0 1-6
- miRNA Isolation Kit 2.0 1-10
- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- *YEA*taq DNA Polymerase 2-1
- Accu DNA Polymerase 2-5
- HiFi DNA Polymerase 2-7
- EZtime Real-Time PCR Premix 2-11
- Deoxy+ Hispec Reverse Transcriptase 2-15
- Deoxy+ OneStep RT-PCR Kit 2-16
- Deoxy+ Real-Time TaqMan RT-PCR Kit 2-18
- Direct RT-PCR Kit 2-19
- dNTPs 2-22
- ECOS™ Competent Cells 3-1
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

Deoxy+ Real-time TaqMan RT-PCR Kit

Description

TaqMan detection system uses a designed fluorogenic probe to detect target PCR products during real-time PCR cycle. Fluorescent is detected when the quencher of probe is removed during the PCR extension cycle. Deoxy+ Real-time TaqMan RT-PCR Kit complete reverse transcription and TaqMan Real-time PCR in a single tube. Yeastern's Deoxy+ HiSpec RT, Hotstart DNA polymerase and all the components necessary for performing TaqMan Real-time PCR from RNA template are specially prepared to ensure high specificity and high sensitivity.

Features

- Ready-to-use master mix to allow faster setup, maximize throughput and reduce the contamination risk of real-time RT-PCR analysis
- Detection of even low copy numbers
- Excellent specificity and reproducibility with better signal to noise ratio
- Higher PCR efficiency

Applications

- Validation of siRNA-mediated gene knockdown
- Detection of multiple gene expressions

Quality Control

The performance of Deoxy+ Real-time TaqMan RT-PCR kit is tested in an RT reaction using human embryonic kidney cell lysate with primer $d(T)_{20}$. The sensitivity of the kit is verified by the detection of B2M transcript after 40 cycles. The length of cDNA achieved is verified by detection of a 248 bp by DNA agarose gel and DNA sequencing.

-20°C

 # FYT505-50P (50 preps)

Deoxy+ Real-time Taqman RT PCR Premix, ROX	0.625 ml
Sterilized ddH_2O	1 ml

 # FYT505-100P (100 preps)

Deoxy+ Real-time Taqman RT PCR Premix, ROX	0.625 ml x 2
Sterilized ddH_2O	1 ml x 2

Related Products

- Genomic DNA Extraction Kit (Tissue) 2.0 1-6
- Genomic DNA Extraction Kit (Plant) 2.0 1-6
- miRNA Isolation Kit 2.0 1-10
- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- *YEA*taq DNA Polymerase 2-1
- Accu DNA Polymerase 2-5
- HiFi DNA Polymerase 2-7
- EZtime Real-Time PCR Premix 2-11
- Deoxy+ Hispec Reverse Transcriptase 2-15
- Deoxy+ OneStep RT-PCR Kit 2-16
- Deoxy+ Real-Time SYBR Green RT-PCR Kit 2-17
- Direct RT-PCR Kit 2-19
- dNTPs 2-22
- ECOS™ Competent Cells 3-1
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

Direct RT-PCR Kit

-20°C

Direct RT-PCR Kit for Culture Cells
 # FYT506-50P
 # FYT506-100P
Please refer to page 2-20

Direct cDNA Kit for Culture Cells
 # FYT507-50P
 # FYT507-100P
Please refer to page 2-20

Direct RT-PCR Kit for Animal Tissues
 # FYT521-50P
Please refer to page 2-21

Direct cDNA Kit for Animal Tissues
 # FYT522-50P
Please refer to page 2-21

Direct RT-PCR Kit for Blood
 # FYT523-50P
Please refer to page 2-22

Direct cDNA Kit for Blood
 # FYT524-50P
Please refer to page 2-22

Description

YB Direct RT-PCR Kits provide fast and simple procedures for preparing first-strand cDNA directly from cultured cells, animal tissues or whole blood without RNA purification. The whole process can be completed in less than 1.5 hours for cultured cells and animal tissues, and 2 hours for blood!

RNA in the lysate can be directly converted to cDNA and subsequently analyzed using the PCR reagents included in the kit or real-time RT-PCR kits purchased elsewhere. Because no removal of genomic DNA is included in the protocol, users need to design primers from the exon-exon junctions of the target mRNA to allow detection of RNA only.

Features

- Prepare sample lysates from cultured cells or animal tissues within 10 min and from whole blood within 30 min, and use directly for RT-PCR.
- From cells or animal tissues to cDNA in only 2 steps and less than 0.5 hour.
- Sensitive in detecting low-abundance transcripts.
- Easy and efficient parallel processing of multiple samples.
- High thermostability of Deoxy+ HiSpec Reverse Transcriptase for specific and long cDNA synthesis.
- Convenient format – premixed solutions for use in RT-qPCR.
- **Requires to design RNA-specific primers for detection of RNA only.**

Applications

- Generation of cDNA products with high fidelity for cloning and sequencing
- Gene expression analysis
- Analysis of a large number of differentially treated cultures or animal tissues
- RT-qPCR

Quality Control

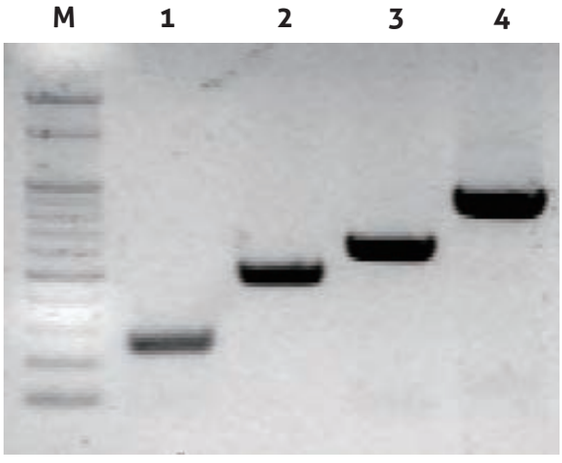
The performance of Direct RT-PCR Kit is tested in an RT reaction using human embryonic kidney cell lysate with B2M specific primer. The sensitivity of the kit is verified by the detection of B2M transcript after 40 cycles. The length of cDNA achieve is verified by detection of a 248 bp by DNA agarose gel and DNA sequencing.

Related Products

- Genomic DNA Extraction Kit (Tissue) 2.0 1-6
- Genomic DNA Extraction Kit (Plant) 2.0 1-6
- miRNA Isolation Kit 2.0 1-10
- YEA Ladder DNA Markers 1-11
- Agarose Standard 1-13
- EZtime Real-Time PCR Premix 2-11
- Direct PCR Kits for Blood/Plants 2-13
- Deoxy+ Hispec Reverse Transcriptase 2-15
- Deoxy+ OneStep RT-PCR Kit 2-16
- Deoxy+ Real-Time SYBR Green RT-PCR Kit 2-17
- Deoxy+ Real-Time TaqMan RT-PCR Kit 2-18
- dNTPs 2-22
- ECOS™ Competent Cells 3-1
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

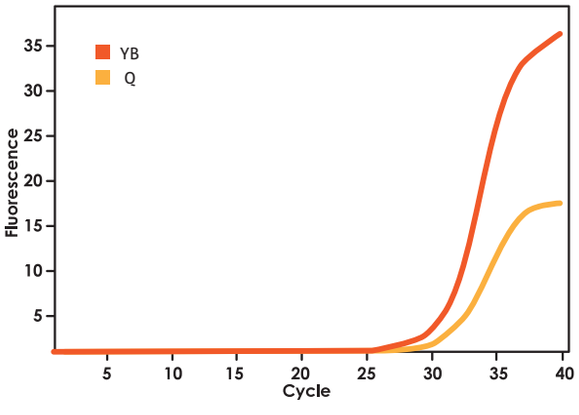
Direct RT-PCR Kit for Culture Cells

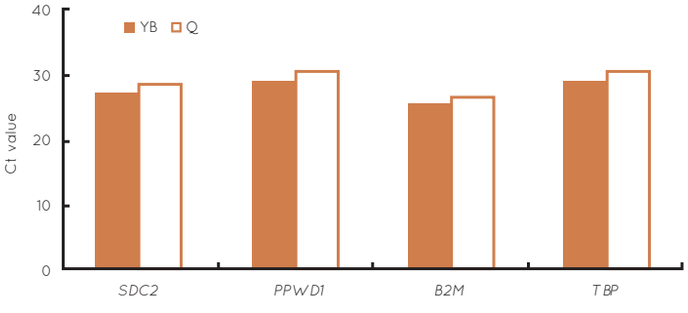
Results



Traditional PCR result by using Direct RT-PCR Kit. Human cultured cells were lysed with the lysis buffer followed by RT reaction. cDNAs in different sizes were amplified using traditional PCR.

Lane M: marker; **Lane 1:** 248 bp;
Lane 2: 484 bp; **Lane 3:** 617 bp;
Lane 4: 856 bp.





Real-time quantitative PCR result by using Direct RT-PCR Kit. The converted cDNA can be used directly for real-time qPCR analysis The Ct values of 4 target genes generated by YB Direct RT-PCR Kit were smaller than those by company Q indicating higher yield.

-20°C

 # FYT506-50P (50 preps)

Wash Buffer	25 ml
Cell Lysis Buffer	1.25 ml x 2
Deoxy+ HiSpec Reverse Transcriptase	100 µl
2× RT Buffer	500 µl
10 µm $d(T)_{20}$	50 µl
Nuclease-free Water	1 ml
RealStart DNA Polymerase Premix	1.25 ml

 # FYT506-100P (100 preps)

Wash Buffer	50 ml
Cell Lysis Buffer	1.25 ml x 4
Deoxy+ HiSpec Reverse Transcriptase	200 µl
2× RT Buffer	1 ml
10 µm $d(T)_{20}$	100 µl
Nuclease-free Water	1 ml
RealStart DNA Polymerase Premix	2.5 ml

 # FYT507-50P (50 preps)

Wash Buffer	25 ml
Cell Lysis Buffer	1.25 ml x 2
Deoxy+ HiSpec Reverse Transcriptase	100 µl
2× RT Buffer	500 µl
10 µm $d(T)_{20}$	50 µl
Nuclease-free Water	1 ml

 # FYT507-100P (100 preps)

Wash Buffer	50 ml
Cell Lysis Buffer	1.25 ml x 4
Deoxy+ HiSpec Reverse Transcriptase	200 µl
2× RT Buffer	1 ml
10 µm $d(T)_{20}$	100 µl
Nuclease-free Water	1 ml

-20°C

Direct RT-PCR Kit for Blood
 # FYT523-50P (50 preps)

Blood Lysis Buffer I	50 ml
Blood Lysis Buffer II	1.25 ml × 2
Deoxy+ HiSpec Reverse Transcriptase	100 µl
2× RT Buffer	0.5 ml
RT Primer (10 µM $d(T)_{20}$)	50 µl
Nuclease-free Water	1 ml
RealStart DNA Polymerase Premix	1.25 ml

Direct cDNA Kit for Blood
 # FYT524-50P (50 preps)

Blood Lysis Buffer I	50 ml
Blood Lysis Buffer II	1.25 ml × 2
Deoxy+ HiSpec Reverse Transcriptase	100 µl
2× RT Buffer	0.5 ml
RT Primer (10 µM $d(T)_{20}$)	50 µl
Nuclease-free Water	1 ml

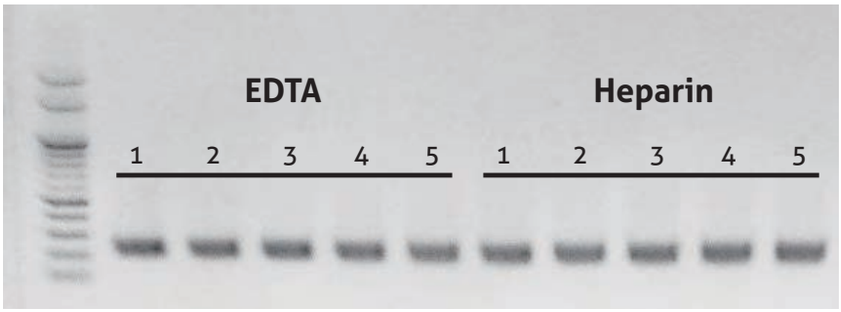
Direct RT-PCR Kit for Animal Tissues
 # FYT521-50P (50 preps)

BioTake™ Tissue Puncher	1 pcs
BioTake™ Tissue Puncher Tips (1.8 mm)	96 pcs
Tissue Lysis Buffer	1.25 ml x 2
Deoxy+ HiSpec Reverse Transcriptase	100 µl
2× RT Buffer	0.5 ml
RT Primer (10 µM $d(T)_{20}$)	50 µl
Nuclease-free Water	1 ml
RealStart DNA Polymerase Premix	1.25 ml

Direct cDNA Kit for Animal Tissues
 # FYT522-50P (50 preps)

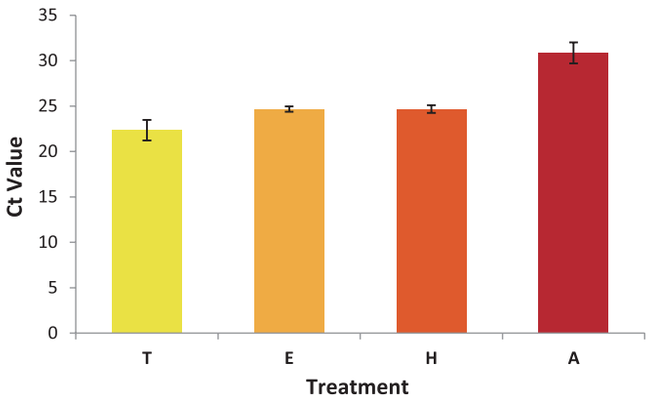
BioTake™ Tissue Puncher	1 pcs
BioTake™ Tissue Puncher Tips (1.8 mm)	96 pcs
Tissue Lysis Buffer	1.25 ml x 2
Deoxy+ HiSpec Reverse Transcriptase	100 µl
2× RT Buffer	0.5 ml
RT Primer (10 µM $d(T)_{20}$)	50 µl
Nuclease-free Water	1 ml

Direct RT-PCR Kit for Blood Results



Traditional PCR results by using Direct RT-PCR Kit for Blood. Human blood was stored in BD EDTA/Heparin Blood Collection Tube for 4 days. The *β-tubulin* gene was amplified using Yeastern's Direct RT-PCR Kit for Blood or Brand A's commercial kit.

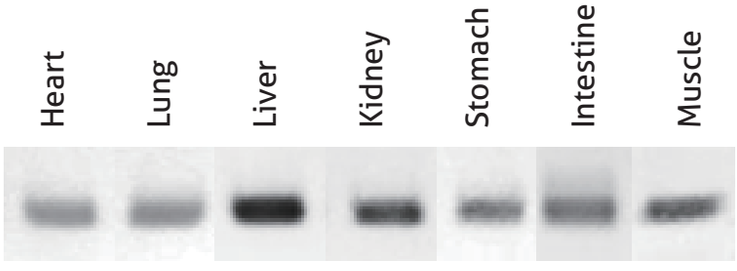
Lane 1: RNA extracted by TRIzol® before performing RT-PCR;
Lane 2: BD EDTA Blood Collection Tube + Yeastern's Direct RT-PCR Kit for Blood;
Lane 3: BD Heparin Blood Collection Tube + Yeastern's Direct RT-PCR Kit for Blood;
Lane 4: BD EDTA Blood Collection Tube + Brand A's direct RT-PCR kit;
Lane 5: BD Heparin Blood Collection Tube + Brand A's direct RT-PCR kit.



Real-time PCR results by using different RT-PCR methods. Human blood was treated with different storage method and followed by RT-PCR. Nfkbia gene was amplified using traditional PCR.

(T) : human blood treated with EDTA and extracted by TRIzol® reagent before performing RT-PCR;
(E) : BD EDTA Blood Collection Tube + Yeastern's Direct RT-PCR Kit for Blood;
(H): BD Heparin Blood Collection Tube + Yeastern's Direct RT-PCR Kit for Blood;
(A) : Tempus™ Blood RNA Tube + Brand A's direct RT-PCR kit.

Direct RT-PCR Kit for Animal Tissues Results



Traditional PCR results by using Direct RT-PCR Kit for Animal Tissues. Mouse tissues were stored in liquid nitrogen for less than a month the genes were amplified using Yeastern's Direct RT-PCR Kit for Animal Tissues.

Deoxynucleotides (dNTPs)

-20°C

 # FYT013-200UL
dNTPs (10 mM) 200 µl

 # FYT014-100UL
dCTP (100 mM) 100 µl

 # FYT015-100UL
dATP (100 mM) 100 µl

 # FYT016-100UL
dGTP (100 mM) 100 µl

 # FYT017-100UL
dTTP (100 mM) 100 µl

Description

Yeastern Biotech offers nucleotides with high purity for use in PCR, RT-PCR, RT assay, DNA labeling reactions and sequencing/cycle sequencing analysis.

Features

- Greater than 99% purity confirmed by HPLC.
- Free of trace contaminating nucleotides.
- Free of endo- and exodeoxyribonuclease, ribonuclease, phosphatase and nicking activities.
- Highly stable – the neutral pH of the nucleotide solutions ensures stability during long-term storage.
- Stable for years at -20°C.
- Stable after multiple freeze-thaw cycles.
- 90-95% of dNTPs remain in triphosphate form after 7 weeks at room temperature.
- 85-90% of dNTPs remain in triphosphate form after 30 cycles of PCR (1 min at 94°C; 3 mins at 72°C).
- Application tested in standard PCR, high fidelity PCR, long range PCR (40 kb), cDNA synthesis, RT-PCR, and real-time PCR.

Applications

Yeastern Biotech dNTPs can be used in all molecular biology applications including standard PCR, high fidelity, long PCR, LAMP-PCR, cDNA synthesis, RT-PCR, real-time PCR, RDA, MDA, DNA labeling and DNA sequencing.

Quality Control

- dCTP, dATP, dGTP and dTTP are all in the form of sodium salt (pH 8.3); > 99% dCTP (HPLC), < 0.9% dCDP.
- Greater than 99% purity of each component confirmed by HPLC. Functionally tested in PCR with Taq and Pfu DNA Polymerases. The absence of endo-, exodeoxyribonuclease, ribonuclease and nicking activities confirmed by appropriate tests.

Related Products

- EZtime Real-Time PCR Premix 2-11
- Direct PCR Kits for Blood/Plants 2-13
- Deoxy+ HiSpec Reverse Transcriptase 2-15
- Deoxy+ OneStep RT-PCR Kit 2-16
- Deoxy+ Real-Time SYBR Green RT-PCR Kit 2-17
- Deoxy+ Real-Time TaqMan RT-PCR Kit 2-18
- Direct RT-PCR Kit 2-19

Gene Cloning

Introduction:
ECOS™ 1 Min Transformation Competent Cells

Description

ECOS™ Competent Cells are the first innovative products of Yeastern Biotech's R&D team, which strives to bring noble products that make research faster and easier. ECOS™ is Yeastern Biotech's registered trademark in USA, Japan, Canada, Korea, and Taiwan. The name speaks for the merits of this line of products - ***E***. ***C****oli* **O**ne-**S**tep transformation. The reverse of this name is SOCE – **SOC E**liminated. ECOS™ protocol allows users to finish the transformation within one step and to skip the SOC recovery step. Therefore, ECOS™ competent cells are the fastest transforming cells worldwide. The traditional protocol requires recovery step and takes 1 ~ 2 hours to finish, but ECOS™ allows transformation to be finished within 1 minute and the procedures are a lot simpler. Please check the ECOS™ protocol section.

The latest progress in the ECOS™ product section is the development of another 3 protocols in addition to the standard ECOS™ protocol that was first introduced in 2003. The non-heat shock protocol allows transformation to be further simplified, and the 2 ~ 6-minute protocol enhances transformation efficiency significantly. These protocols have been developed based on the results of numerous experiments involving different antibiotics, plasmid size, and various conditions. Now, Yeastern Biotech offers our customers a new ECOS™ competent cells with similar transformation efficiency to that of electroporation for applications which require very high transformation efficiency such as the construction of genomic libraries.

ECOS™ Efficiency Guarantee

ECOS™ competent cells should be stored in a – 70°C freezer. Since competent cells are very sensitive to freeze-thaw cycles, exposure to temperature variations should be minimized. In order to control the quality of competent cells, Yeastern Biotech adds electronic temperature monitors to record the temperature during the shipping process. Yeastern Biotech is the only company that offers this service.

ECOS™ Technology is Patented

Yeastern Biotech Co., Ltd. owns the patent of ECOS™ technology (including protocol) exclusively in Canada **(TMA622,671)**, USA **(US 6,864,088, US 7,098,033, US 7,820,443)**, UK **(GB2383582)**, German **(Nr. 102 51 429)**, France **(FR 2832727)**, Taiwan **(I 229696)**, China **(ZL 2005 1 0112590.8)**, Korea **(0604787, 10-1350283)**, and Japan **(4867595)**. Under the protection of this patent, Yeastern Biotech is the only company that has the right to use the protocol with the claims that transformation with our ECOS™ chemically competent cells can be finished within one minute and SOC is not needed. If any one intends to sell competent cells that use ECOS™ protocol or its similar version, please contact our headquarter in Taiwan for licensing.

Features

- No LB/SOC required
- Revolutionary 1- or 6-minute transformation, instead of 1 ~ 2 hours
- Procedures are simplified
- Several protocols to choose from according to your needsin efficiency and convenience
- Strict QC process to check the efficiency of each batch produced
- Ideal for bench users to automatize cloning projects
- Electronically monitored shipping process to check temperature fluctuation during shipping

Quality Control

Each lot of competent cells has to pass three quality control tests before shipping:

1. **Efficiency test :** each batch of ECOS™ should meet the claimed transformation efficiency at the time of production using Protocol 1 or 3 (Page 3-2) and supercoiled pUC19 DNA.
2. **Contamination test :** competent cells were plated directly on ampicillin plates without being transformed. To pass the test, no colonies should be seen after overnight incubation.
3. **A-complementation test :** this test is performed for all ECOS™ competent cells except for ECOS™ 21(DE3) and ECOS™ 2163. To pass the test, the ratio of white colonies over the total colonies should be less than 3%.

ECOS™ Protocol Comparison Table

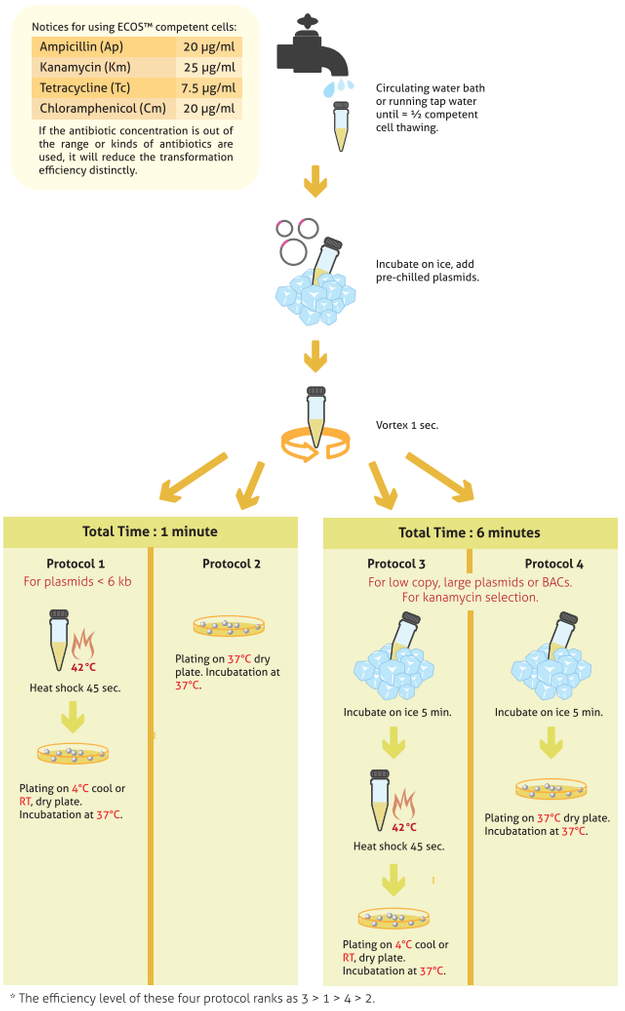
Competent Cell Types	ECOS™ Competent Cells	Traditional Chemically Competent Cells	Electro-Competent Cells
Time	**1 ~ 6 minutes**	1.5 ~ 2 hours	1.5 ~ 2.5 hours
Protocol	• **One step** • **No incubation on ice after heat shock** • **No tube change** • **No recovery step**	• Multiple steps • Requires incubation on ice after heat shock • Require tube change • Require recovery step	• Multiple steps • Requires incubation on ice after heat shock • Require tube change • Require recovery step
Authentic Representation	**High**	Require recovery step	Require recovery step
Transformation Efficiency	**10^7~ 10^{10} cfu/μg pUC19**	10^6 ~ 10^9 cfu/μg pUC19	~ 10^{10} cfu/μg pUC19
Cost	**Low**	High	High

ECOS™ Protocol

Notices for using ECOS™ competent cells:

Ampicillin (Ap)	20 μg/ml
Kanamycin (Km)	25 μg/ml
Tetracycline (Tc)	7.5 μg/ml
Chloramphenicol (Cm)	20 μg/ml

If the antibiotic concentration is out of the range or kinds of antibiotics are used, it will reduce the transformation efficiency distinctly.



* The efficiency level of these four protocol ranks as 3 > 1 > 4 > 2.

ECOS™ 96-Well Protocol

Thaw ECOS™ Competent Cells
(4°C chamber for 3 ~ 4 minutes or pre-chilled metal block for ~ 30 seconds)

↓

Add Plasmid

↓

(0 ~ 4°C for 5 ~ 10 mins)

↙ ↘

No Heat Shock — 42°C for 15 ~ 45 secs

↓ ↓

Warm Plating — Cold Plating

↘ ↙

Incubate at 37°C

Total time: Only 5 ~ 10 minutes

Features

Mutation	Applications	ECOS™ X / ECOS™ 101 [DH5α]	ECOS™ 9-5 [JM109]	ECOS™ Blue [XL1-Blue]	ECOS™ 21 [BL21(DE3)]	ECOS™ 10B [DH10B]	ECOS™ 2163 [GM2163]
		F⁻ *endA1 hsdR17*(rk^-, mk^-) *supE44 thi-1* λ^- *recA1 gyrA96 relA1 Δ(argF-lacZYA)* U169 Φ80d *lacZ* ΔM15 *deoR*	F' *traD36 proA⁺ proB⁺ lacIq Δ(lacZ)* M15 *Δ(lac-proAB) supE44 hsdR17 recA1 gyrA96 thi⁻1 endA1 relA1 e14⁻* λ^-	F' *recA1 endA1 gyrA96 thi⁻1 hsdR17*(rk^-, mk^+) *supE44* λ^- *Δ(lac) proAB lacIqZ*ΔM15 *Tn10 (tet')*	F⁻ *hsdS gal (λ cIts857 ind1 Sam7 nin5 lacUV5-T7 gene l)*	F⁻ *endA1 recA1 galE15 galK16 nupG rpsL ΔlacX74* Φ80d *lacZ* ΔM15 *araD139 Δ(lara,leu)7697 mcrA Δ(mrr⁻ hsdRMS⁻mcr BC)* λ^-	F⁻ *ara⁻14 leuB6 thi⁻1 fhuA31 lacY1 tsx⁻78 galK2 galT22 supE44 rpsL136(strr) xyl⁻5 mtl⁻1 dam13:Tn9 (camr) dcm⁻6 mcrB1 hsdR2*(rk^-mk^+) *mcrA*
endA1	Prevent DNA degradation during extraction	√	√	√	X	√	X
recA1	Prevent DNA recombination	√	√	√	X	√	X
hsdR	Improve transformation efficiency (for unmethylated PCR DNA and cDNA)	√	√	√	√	√	√
deoR	Improve transformation efficiency (for large size plasmid and cosmids)	√	X	X	X	√	X
LacZ M15	Inhibit *LacZ* gene expression for blue/white screen	√	√	√	X	√	X
rne131	Inhibit RNase E and improve mRNA stability	X	X	X	√	X	X
ompT & Lon	*ompT* & Lon Protease deficient and improve protein yield	X	X	X	√	X	X
dam / dcm	Prevent DNA methylation	X	X	X	√ / X	X	√ / √
mcrA / mcrB	Prevent methylated DNA from degradation	X	X	X	X	√ / √	√ / √

ECOS™ Protocol Comparison Table

Cloning Applications	ECOS™ X / ECOS™ 101 [DH5α]	ECOS™ 9-5 [JM109]	ECOS™ Blue [XL1-Blue]	ECOS™ 21 [BL21(DE3)]	ECOS™ 10B [DH10B]	ECOS™ 2163 [GM2163]
Large Plasmids > 6 kb	Ideal	*	*	*	Yes	Yes
Subcloning	Ideal	Yes	Yes	*	Ideal	No
cDNA Library	Yes	Yes	Yes	*	Yes	*
Fast Growth	*	Ideal	*	Yes	*	*
Single Stranded DNA	*	Ideal	*	*	*	*
Mutagenesis	Yes	*	*	No	Yes	*
Protein Expression	No	No	No	Ideal	*	No
Toxic Protein Expression	No	No	No	No	No	No
Blue/White Screen	Yes	Yes	Ideal	No	Yes	No
DNA Unmethylation	No	No	No	No	No	Yes
Genomic DNA Cloning	No	No	No	No	Yes	No

* Means the strain can be used for the purpose but may not yield the best result.

ECOS™ X Competent Cells

Strain: DH5α

-70°C

 # FYE610-10VL (10 preps)
Efficiency >5 x 10^9 cfu/μg

100 μl/vial	10 vials
Control Plasmid (pUC19)	5 μl (10^{-4} μg/μl)

 # FYE610-80VL (80 preps)
Efficiency >5 x 10^9 cfu/μg

100 μl/vial	80 vials
Control Plasmid (pUC19)	5 μl (10^{-4} μg/μl)

Related Products

- HiYield Plasmid Mini Kit 2.0 1-4
- O' in 1 DNA Polymerase Premix 2-3
- RealStart DNA Polymerase Premix 2-9
- Eztime Real-Time PCR Premix 2-11
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12
- Glass Plating Beads 3-22

Description

DH5α is the most popular *E. coli* strain for everyday cloning applications. It supports blue/white screening for easy selection of recombinant DNA with X-Gal. In addition, DH5α carries *rec*A1 mutation that eliminates homologous recombination ensuring insert stability. It also carries *end*A1 mutations that greatly improve the quality of plasmid DNA and yield prepared from mini-prep. It is useful for the transformation of large plasmids and two-hybrid systems (up to 20 kb).

After 5-year invention based on our ECOS™ technology, Yeastern Biotech is able to offer our customers a brand new competent cell product with similar transformation efficiency to that of electroporation. ECOS™ X can be utilized for applications which require very high transformation efficiency such as the construction of genomic libraries. The "X" as shown in the name, stands for extreme, meaning this competent cell was designed to exceed limitation and to set new limitation! The "X" also represents "10" in Roman numeral; our new product aims to reach 10^{10} in its efficiency.

Genotype

F⁻ *endA1 hsdR17*(rk⁻, mk⁻) *supE44 thi-1 λ⁻recA1 gyrA96 relA1 Δ(argF-lacZYA)* U169 Φ80d *lacZ* ΔM15 *deoR*

Features

- One step in one tube and finish in 6 minutes
- High efficiency as electro-competent cells
- Requires no expensive equipment

Applications

- Efficient transformation of products from routine TA cloning
- Transformation of minute amounts of PCR products
- Construction of a more representative gene library

Efficiency

> 5 x 10^9 cfu/ μg

Recommended for:

- Super high efficiency cloning
- Cloning lowest abundance cDNA
- Gene library

Do not store the cells in liquid nitrogen!

ECOS™ 101 Competent Cells

Strain: DH5α

Description

DH5α is the most popular *E. coli* strain for everyday cloning applications. It supports blue/white screening for easy selection of recombinant DNA with X-Gal. In addition, DH5α carries *rec*A1 mutation that eliminates homologous recombination ensuring insert stability. It also carries *end*A1 mutations that greatly improve the quality of plasmid DNA and yield prepared from mini-prep. It is useful for the transformation of large plasmids and two-hybrid systems (up to 14 kb).

Genotype

F^- *endA1 hsdR17*(rk^-, mk^-) *supE44 thi-1* λ^- *recA1 gyrA96 relA1 Δ(argF-lacZYA)* U169 Φ80d *lacZ* ΔM15 *deoR*

Features

Suitable for cloning with large plasmid and cDNA library construction, and also allow blue-white colony screening.

Applications

- Cloning and subcloning
- Scale-up application
- Blue/white screening

Efficiency

> 1 x 10^8 cfu/µg

Recommended for:
- Subcloning
- General cloning

>3 x 10^8 cfu/µg

Recommended for:
- High efficiency cloning
- Cloning low abundance transcripts
- General cloning
- Gene library

> 1 x 10^9 cfu/µg

Recommended for:
- Super high efficiency cloning
- Cloning lowest abundance transcripts
- Gene library

Do not store the cells in liquid nitrogen!

-70ºC

 # FYE607-10VL (10 preps)
Efficiency > 1 x 10^8 cfu/µg
100 µl/vial 10 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE607-80VL (80 preps)
Efficiency > 1 x 10^8 cfu/µg
100 µl/vial 80 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE608-10VL (10 preps)
Efficiency > 3 x 10^8 cfu/µg
100 µl/vial 10 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE608-80VL (80 preps)
Efficiency > 3 x 10^8 cfu/µg
100 µl/vial 80 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE609-10VL (10 preps)
Efficiency > 1 x 10^9 cfu/µg
100 µl/vial 10 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE609-80VL (80 preps)
Efficiency > 1 x 10^9 cfu/µg
100 µl/vial 80 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE607-96WL (96 preps)
Efficiency > 1 x 10^8 cfu/µg
50 µl/well 96 wells

 # FYE608-96WL (96 preps)
Efficiency > 3 x 10^8 cfu/µg
50 µl/well 96 wells

 # FYE609-96WL (96preps)
Efficiency > 1 x 10^9 cfu/µg
50 µl/vial 96 wells

 # FYE678-10VL (10 preps)
Efficiency > 5 x 10^8 cfu/µg
100 µl/vial 10 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE678-80VL (80 preps)
Efficiency > 5 x 10^8 cfu/µg
100 µl/vial 80 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

Related Products please refer to 3-5

ECOS™ 9-5 Competent Cells

Strain: JM109

-70°C

 # FYE707-10VL (10 preps)
Efficiency > 5 x 10^7 cfu/µg
100 µl/vial 10 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE707-80VL (80 preps)
Efficiency > 5 x 10^7 cfu/µg
100 µl/vial 80 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE708-10VL (10 preps)
Efficiency > 1 x 10^8 cfu/µg
100 µl/vial 10 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE708-80VL (80 preps)
Efficiency > 1 x 10^8 cfu/µg
100 µl/vial 80 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE709-10VL (10 preps)
Efficiency > 1 x 10^9 cfu/µg
100 µl/vial 10 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE709-80VL (80 preps)
Efficiency > 1 x 10^9 cfu/µg
100 µl/vial 80 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE707-96WL (96 preps)
Efficiency > 5 x 10^7 cfu/µg
50 µl/well 96 wells

 # FYE708-96WL (96 preps)
Efficiency > 1 x 10^8 cfu/µg
50 µl/well 96 wells

 # FYE709-96WL (96preps)
Efficiency > 1 x 10^9 cfu/µg
50 µl/vial 96 wells

Related Products

- HiYield Plasmid Mini Kit 2.0 1-4
- O' in 1 DNA Polymerase Premix 2-3
- RealStart DNA Polymerase Premix 2-9
- Eztime Real-Time PCR Premix 2-11
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12
- Glass Plating Beads 3-22

Description

JM109, a K strain bacterium, carries mutations in *rec*A and *end*A, leading to minimal recombination and improved quality of isolated plasmid DNA. In addition, the cells carry the F' episome which allows blue/white screening for recombinant DNA. Thus, it has been a popular strain for routine subcloning. The cells can also be utilized for single-stranded DNA rescue when M13 or phagemid systems are used simultaneously. The JM109 strain is sensitive to all common antibiotics.

This product can become a powerful cloning tool when it is used in combination with Yeastern's rapid ligation kit **(#FYC003-100R)**. The ligation can be finished within 5 minutes and followed by 1-minute transformation. The fast growth rate of JM109 allows colonies to show up within 8 hours. Try this strain when you are in urgent.

Genotype

F' *traD36 proA*$^+$ *proB*$^+$ *lacIq Δ(lacZ)*M15 *Δ(lac-proAB) supE44 hsdR17 recA1 gyrA96 thi*$^-$*1 endA1 relA1 e14*$^-$ *λ*$^-$

Features

- Rapid growing strain
- Carries F' episome

Applications

- Preparation of ssDNA
- Construction of gene library
- Subcloning

Efficiency

> 1 x 10^8 cfu/µg

Recommended for:
- High efficiency cloning
- Cloning low abundance transcripts
- General cloning
- Gene library

> 1 x 10^9 cfu/µg

Recommended for:
- High efficiency cloning
- Cloning low abundance transcripts
- General cloning
- Gene library

> 5 x 10^7 cfu/µg

Recommended for:
- Subcloning
- General cloning

Do not store the cells in liquid nitrogen!

ECOS™ Blue Competent Cells

Strain: XL1-Blue

Description

XL1-Blue is the most popular strain for blue/white screening. It is also an excellent host strain for routine cloning application using plasmid or lambda vectors. XL1-Blue cells are endonuclease (*end*A) deficient, which greatly improve the quality of mini-prep DNA, and are recombination (*rec*A) deficient, improving insert stability. The *hsd*R mutation prevents the cleavage of cloned DNA by the *Eco*K endonuclease system. The *lacIqZΔM15* gene on the F´ episome allows blue-white color screening.

Genotype

F' *recA1 endA1 gyrA96 thi⁻ 1 hsdR17*(rk⁻, mk⁺) *supE44 λ⁻ Δ(lac) proAB lacIqZΔ*M15 *Tn10 (tet^r)*

Features

- A strain modified to be ideal for blue/white screening
- Tetracycline resistant

Applications

- Routine cloning application
- Subcloning
- cDNA library
- Blue/white screening

Efficiency

> 5 x 10^7 cfu/μg

Recommended for:
- Routine cloning and subcloning
- Blue/white screening

> 2 x 10^9 cfu/μg

Recommended for:
- Routine cloning and subcloning
- Blue/white screening

> 5 x 10^8 cfu/μg

Recommended for:
- Routine cloning and subcloning
- Blue/white screening
- cDNA library

Do not store the cells in liquid nitrogen!

-70ºC

 # FYE107-10VL (10 preps)
Efficiency > 1 x 10^8 cfu/μg
100 μl/vial 10 vials
Control Plasmid (pUC19) 5 μl (10^{-4} μg/μl)

 # FYE107-80VL (80 preps)
Efficiency > 1 x 10^8 cfu/μg
100 μl/vial 80 vials
Control Plasmid (pUC19) 5 μl (10^{-4} μg/μl)

 # FYE108-10VL (10 preps)
Efficiency > 5 x 10^8 cfu/μg
100 μl/vial 10 vials
Control Plasmid (pUC19) 5 μl (10^{-4} μg/μl)

 # FYE108-80VL (80 preps)
Efficiency > 5 x 10^8 cfu/μg
100 μl/vial 80 vials
Control Plasmid (pUC19) 5 μl (10^{-4} μg/μl)

 # FYE109-10VL (10 preps)
Efficiency > 2 x 10^9 cfu/μg
100 μl/vial 10 vials
Control Plasmid (pUC19) 5 μl (10^{-4} μg/μl)

 # FYE109-80VL (80 preps)
Efficiency > 2 x 10^9 cfu/μg
100 μl/vial 80 vials
Control Plasmid (pUC19) 5 μl (10^{-4} μg/μl)

 # FYE107-96WL (96 preps)
Efficiency > 1 x 10^8 cfu/μg
50 μl/well 96 wells

 # FYE108-96WL (96 preps)
Efficiency > 5 x 10^8 cfu/μg
50 μl/well 96 wells

 # FYE109-96WL (96preps)
Efficiency > 2 x 10^9 cfu/μg
50 μl/vial 96 wells

Related Products

- HiYield Plasmid Mini Kit 2.0 1-4
- O' in 1 DNA Polymerase Premix 2-3
- RealStart DNA Polymerase Premix 2-9
- Eztime Real-Time PCR Premix 2-11
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12
- Glass Plating Beads 3-22

ECOS™ 21 Competent Cells

Strain: BL21(DE3)

-70°C

 # FYE207-5VL (5 preps)
Efficiency > 2 x 10^7 cfu/µg
100 µl/vial 5 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE207-40VL (40 preps)
Efficiency > 2 x 10^7 cfu/µg
100 µl/vial 40 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE207-96WL (96 preps)
Efficiency > 2 x 10^7 cfu/µg
50 µl/well 96 wells

Description

This strain provides high levels of protein expression. This strain carries the lambda DE3 lysogen, which expresses T7 RNA polymerase from the *lac*UV5 promoter by isopropyl-1-thio-ß-D-galactopyranoside (IPTG) induction. The mutated rne gene (*rne*131) encodes a truncated RNase E enzyme that lacks the ability to degrade mRNA, resulting in an increase in mRNA stability. The transformation efficiency of BL21 is usually low, so the 6 minutes/ heat shock cold plating protocol is recommended if high efficiency is desired.

Genotype

F^- *hsdS gal (λ cIts857 ind1 Sam7 nin5 lacUV5-T7 gene I)*

Features

- Lack of Lon and Omp proteases allows high-level protein expression and accumulation
- Easy gene induction

Applications

- IPTG induced gene expression in *E. coli*
- Ideal for high level expression of non-toxic recombinant protein expression using T7-based expression vectors
- Subcloning

Efficiency

> 2 x 10^7 cfu/µg

Recommended for:
- Recombinant protein expression
- Subcloning

Related Products

- HiYield Plasmid Mini Kit 2.0 1-4
- O' in 1 DNA Polymerase Premix 2-3
- RealStart DNA Polymerase Premix 2-9
- Eztime Real-Time PCR Premix 2-11
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12
- Glass Plating Beads 3-22

Do not store the cells in liquid nitrogen!

ECOS™ 10B Competent Cells

Strain: DH10B

Description

DH10B is an MC1061 derivative. This strain was designed for the propagation of large insert DNA library clones. It is used extensively, taking advantage of properties such as high DNA transformation efficiency and maintenance of large plasmids.

While DH10B has been classically reported to be *gal*U *gal*K, the preliminary genome sequence for DH10B indicates that DH10B is actually *gal*E *gal*K *gal*U+. Genome sequence indicates that DH10B is actually *deo*R+. Complete genome sequence has been published.

Genotype

F⁻ *endA1 recA1 galE15 galK16 nupG rpsL ΔlacX74* Φ80d *lacZ* ΔM15 *araD139 Δ(lara,leu)7697 mcrA Δ(mrr⁻hsdRMS⁻mcrBC) λ⁻*

Features

- Streptomycin resistant
- High transformation efficiency

Applications

- Suitable for genomic DNA cloning
- Allow large inserts
- Cloning of methylated cytosine or adenine containing DNA
- Blue/white screening

Efficiency

> 5 x 10^7 cfu/μg

Recommended for:

- Subcloning
- Genomic DNA cloning

> 2 x 10^8 cfu/μg

Recommended for:

- Cloning of large inserts
- Genomic DNA cloning

Do not store the cells in liquid nitrogen!

-70ºC

 # FYE507-10VL (10 preps)
Efficiency > 5 x 10^7 cfu/μg

100 μl/vial	10 vials
Control Plasmid (pUC19)	5 μl (10^{-4} μg/μl)

 # FYE507-80VL (80 preps)
Efficiency > 5 x 10^7 cfu/μg

100 μl/vial	80 vials
Control Plasmid (pUC19)	5 μl (10^{-4} μg/μl)

 # FYE508-10VL (10 preps)
Efficiency > 2 x 10^8 cfu/μg

100 μl/vial	10 vials
Control Plasmid (pUC19)	5 μl (10^{-4} μg/μl)

 # FYE508-80VL (80 preps)
Efficiency > 2 x 10^8 cfu/μg

100 μl/vial	80 vials
Control Plasmid (pUC19)	5 μl (10^{-4} μg/μl)

 # FYE507-96WL (96 preps)
Efficiency > 5 x 10^7 cfu/μg

50 μl/well	96 wells

Related Products

- HiYield Plasmid Mini Kit 2.0 1-4
- O' in 1 DNA Polymerase Premix 2-3
- RealStart DNA Polymerase Premix 2-9
- Eztime Real-Time PCR Premix 2-11
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12
- Glass Plating Beads 3-22

ECOS™ 2163 Competent Cells

Strain: GM2163

-70°C

 # FYE807-10VL (10 preps)
Efficiency > 1 x 10^7 cfu/µg
100 µl/vial 10 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE807-80VL (80 preps)
Efficiency > 1 x 10^7 cfu/µg
100 µl/vial 80 vials
Control Plasmid (pUC19) 5 µl (10^{-4} µg/µl)

 # FYE807-96WL (96 preps)
Efficiency > 1 x 10^7 cfu/µg
50 µl/well 96 wells

Description

GM2163 is an *E. coli* K12 strain, which is deficient in both *dam* and *dcm* genes thus is suitable for the propagation of plasmid or cloned DNA to be cut with Dam or Dcm-sensitive restriction enzymes. This strain is not recommended as a host for primary cloning/ligation since the *dam* mutation can result in higher mutation rates and a reduction in the transformation efficiency.

Genotype

F$^-$ *ara*$^-$*14 leuB6 thi*$^-$*1 fhuA31 lacY1 tsx*$^-$*78 galK2 galT22 supE44 rpsL136(strr) xyl*$^-$*5 mtl*$^-$*1 dam13:Tn9 (camr) dcm*$^-$*6 mcrB1 hsdR2*(rk$^-$mk$^+$) *mcrA*

Features

- Chloramphenicol resistant
- Not suitable for blue/white screening
- Not recommended as a host for primary cloning/ligation

Applications

- Propagation of plasmid free of Dam and Dcm methylations

Efficiency

> 1 x 10^7 cfu/µg

Recommended for:

- Propagation of plasmid to be cut with Dam or Dcm-sensitive restriction enzymes

Do not store the cells in liquid nitrogen!

Related Products

- HiYield Plasmid Mini Kit 2.0 1-4
- O' in 1 DNA Polymerase Premix 2-3
- RealStart DNA Polymerase Premix 2-9
- Eztime Real-Time PCR Premix 2-11
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12
- Glass Plating Beads 3-22

T&A™ Cloning Kit
T&A™ Cloning Kit II

Description

Molecular cloning assisted by vectors is the most popular and common method to obtain genes of interest. Yeastern Biotech's T&A™ Cloning Kit offers a quick, reliable and efficient method for cloning a variety of DNA sequences.

The T&A™ Cloning Kit (**FYC001-20P**) contains the T&A™ Cloning Vector and all the reagents needed for ligation. It is a convenient pack for cloning PCR product generated using thermostable DNA polymerases, such as *YEA*taq DNA polymerase, which add a single terminal 3'-dA nucleotide overhang. After ligation, the mixture can be used directly for transformation into competent cells (ECOS™) or be purified first to achieve higher transformation efficiency.

Recently, YB has designed a new cloning vector for user convenience. The new T&A™ Cloning Vector II (**FYC101-20P**) consist of 2 *Eco*R I cutting sites (441, 500) within the multiple cloning site.

Features

- Fast ligation, completed in only 5 minutes
- High transformation efficiency
- More accurate results
- Accept a wide range of inserts with different sizes
- Two types of ligation buffers provided for your convenience
- Allow blue/white screening
- Contain ampicillin marker for antibiotic selection
- Include M13 primer sites for convenient sequencing

Applications

Cloning of terminal 3'-dA nucleotides overhang PCR products up to 5 kb

Quality Control

- DNA concentration of the vectors is 25 ng/μl
- The absorbance ratio (A_{260}/A_{280}) is between 1.6~2.0
- The size of the vectors is about 2.7 kb
- The colony number of background control is less than 50 when the transformation efficiency of competent cells is 1×10^8 cfu/μg DNA
- The colony number ratio of self-ligation control to positive control is less than 15%
- The colony number of positive control is more than 500 when the transformation efficiency of competent cells is 5×10^8 cfu/μg DNA
- The ligation correctness with the control insert into the vectors is more than 87.5%

-20°C

FYC001-20P (20 preps)

T&A™ Cloning Kit

T&A™ Cloning Vector	40 μl (25 ng/μl)
Control Insert DNA	10 μl (10 ng/μl)
yT4 DNA Ligase	20 μl
10× Ligation Buffer A	50 μl
10× Ligation Buffer B	50 μl
Forward Primer (M13-F)	50 μl (10 μM)
Reverse Primer (M13-R)	50 μl (10 μM)

FYC002-20P (20 preps)

T&A™ Cloning Vector	40 μl (25 ng/μl)
Control Insert DNA	10 μl (10 ng/μl)

FYC101-20P (20 preps)

T&A™ Cloning Kit II

T&A™ Cloning Vector II	40 μl (25 ng/μl)
Control Insert DNA	10 μl (10 ng/μl)
yT4 DNA Ligase	20 μl (2 U/μl)
10× Ligation Buffer A	50 μl
10× Ligation Buffer B	50 μl
Forward Primer (M13-F)	50 μl (10 μM)
Reverse Primer (M13-R)	50 μl (10 μM)

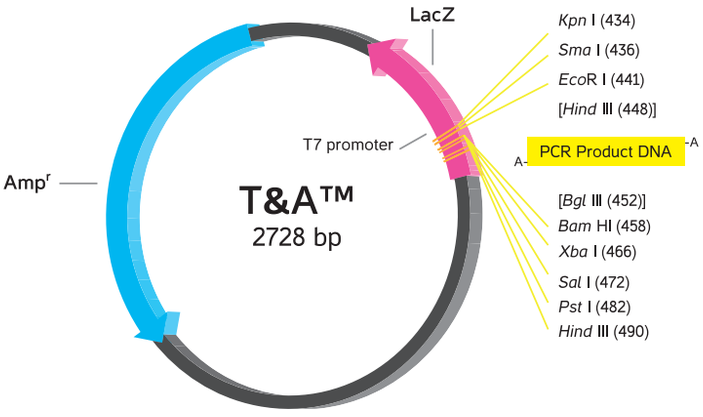
FYC102-20P (20 preps)

T&A™ Cloning Vector II	40 μl (25 ng/μl)
Control Insert DNA	10 μl (10 ng/μl)

Related Products

- HiYield Plasmid Mini Kit 2.0 1-4
- HiYield Gel/PCR DNA Fragment Extraction Kit 2.0 1-5
- Agarose Standard 1-13
- *YEA*taq DNA Polymerase 2-1
- O'in 1 DNA Polymerase Premix 2-3
- Accu DNA Polymerase 2-5
- HiFi DNA Polymerase 2-7
- RealStart DNA Polymerse Premix 2-9
- EZtime Real-Time PCR Premix 2-11
- dNTP 2-22
- ECOS™ Competent Cells 3-1

Map and Sequence reference points of the T&A™ Cloning Vector



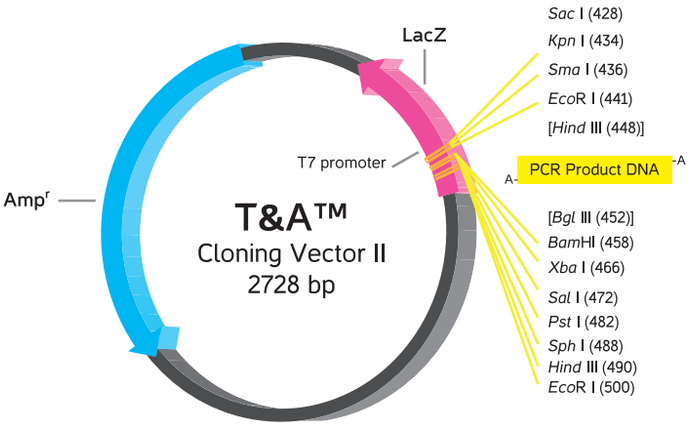
Multiple Cloning region	434 to 496
*Lac*Z start codon	511
*Lac*Z operator	531 to 548
*Lac*Z gene	511 to 149
Amp^r gene	2528 to 1671
T7 promoter	402 to 439
M13 forward primer	359 to 375
M13 reverse primer	507 to 528
β-lactamase coding region	1524 to 2528
Lac operon sequences	239 to 398, 488 to 725

* Before the insert incorporate into the T&A™ Cloning Vector, there is only one *Hin*d III site and no *Bgl* II site. After the incorporation, the T and A nucleotide on the insert will complement the sequence on the vector and generate these two new sites. This merit of T&A™ Cloning Vector makes cloning more economic and convenient.

```
                                  M13 Forward Primer
301  TACGCCAGCT   GGCGAAAGGG   GGATGTGCTG   CAAGGCGATT   AAGTTGGGTA
     ATGCGGTCGA   CCGCTTTCCC   CCTACACGAC   GTTCCGCTAA   TTCAACCCAT

                                  M13 Forward Primer
351  ACGCCAGGGT   TTTCCCAGTC   ACGACGTTGT   AAAACGACGG   CCAGTGAATT
     TGCGGTCCCA   AAAGGGTCAG   TGCTGCAACA   TTTTGCTGCC   GGTCACTTAA

                  T7 Promoter                  Kpn I  Sma I   EcoR I   Hind III
401  GTAATACGAC   TCACTATAGG   GCGAGCTCGG   TACCCGGGCG   AATTCCAAGC
     CATTATGCTG   AGTGATATCC   CGCTCGAGCC   ATGGGCCCGC   TTAAGGTTCG

                            Bgl II   BamH I   Xba I   Sal I   Pst I
451  T T   Insert
     A A-  DNA    --AGATCTGGAT   CCCCTCTAGA   GTCGACCTGC   AGGCATGCAA
                  TCTAGACCTA   GGGGAGATCT   CAGCTGGACG   TCCGTACGTT

     Hind III
493  GCTTGGCGTA   ATCATGGTCA   TAGCTGTTTC   CTGTGTGAAA   TTGTTATCCG
     CGAACCGCAT   TAGTACCAGT   ATCGACAAAG   GACACACTTT   AACAATAGGC
                                  M13 Reverse Primer
```

Enzyme	Position	Enzyme	Position	Enzyme	Position	Enzyme	Position	Enzyme	Position
Aat II	2664	*Asp*E I	1742	*Cfr*10 I	1822	*Mam* I	457	*Ssp* I	2546
*Acc*65 I	430	*Ava* I	434	*Dra* II	2718	*Nar* I	237	*Xba* I	466
Acc I	473	*Ban* II	428	*Eam*1105 I	1742	*Nde* I	185	*Xma* I	434
Acs I	441	*Bam*H I	458	*Ecl*136 II	426	*Pst* I	482	*Xmn* I	2341
Afl III	849	*Bcg* I	2281	*Eco*0109 I	2718	*Sac* I	428		
Ahd I	1742	*Bpm* I	1812	*Eco*R I	441	*Sal* I	472		
*Alw*N I	1265	*Bsa*B I	457	*Hinc* II	474	*Sap* I	733		
Apo I	441	*Bsa* I	1803	*Hind* II	474	*Sca* I	2222		
*Asp*700	2341	*Bsp*M I	485	*Kas* I	236	*Sma* I	436		
*Asp*718	430	*Bsr*F I	1822	*Kpn* I	434	*Sph* I	488		

Map and Sequence reference points of the T&A™ Cloning Vector II



Multiple Cloning region	434 to 504
LacZ start codon	511
LacZ operator	531 to 548
LacZ gene	511 to 149
Amp^r gene	2528 to 1671
T7 promoter	402 to 439
M13 forward primer	359 to 375
M13 reverse primer	507 to 528
β-lactamase coding region	1524 to 2528
Lac operon sequences	239 to 398, 488 to 725

* Before the insert incorporate into the T&A™ Cloning Vector II, there is only one *Hind* III site and no *Bgl* II site. After the incorporation, the T and A nucleotide on the insert will complement the sequence on the vector and generate these two new sites. This merit of T&A™ Cloning Vector II makes cloning more economic and convenient.

```
301  TACGCCAGCT      GGCGAAAGGG      GGATGTGCTG      CAAGGCGATT      AAGTTGGGTA
     ATGCGGTCGA      CCGCTTTCCC      CCTACACGAC      GTTCCGCTAA      TTCAACCCAT

                  M13 Forward Primer
351  ACGCCAGGGT      TTTCCCAGTC      ACGACGTTGT      AAAACGACGG      CCAGTGAATT
     TGCGGTCCCA      AAAGGGTCAG      TGCTGCAACA      TTTTGCTGCC      GGTCACTTAA

                T7 Promoter                    Sac I   Kpn I  Sma I   EcoR I   Hind III
401  GTAATACGAC      TCACTATAGG      GCGAGCTCGG      TACCCGGGCG      AATTCCAAGC
     CATTATGCTG      AGTGATATCC      CGCTCGAGCC      ATGGGCCCGC      TTAAGGTTCG

                        Bgl II    BamH I    Xba I     Sal I     Pst I     Sph I
451  T T   Insert      -A GATCTGGAT    CCCCTCTAGA      GTCGACCTGC      AGGCATGCAA
     A A-  DNA         T CTAGACCTA     GGGGAGATCT      CAGCTGGACG      TCCGTACGTT

     Hind III   EcoR I
491  GCTTGGCGGA      ATTCTGGTCA      TAGCTGTTTC      CTGTGTGAAA      TTGTTATCCG
     CGAACCGCCT      TAAGACCAGT      ATCGACAAAG      GACACACTTT      AACAATAGGC
                                    M13 Reverse Primer
```

Enzyme	Position	Enzyme	Position	Enzyme	Position	Enzyme	Position	Enzyme	Position
Aat II	2664	*Ava* I	434	*Bsr*F I	1822	*Kas* I	236	*Sap* I	733
*Acc*65 I	430	*Bam*H I	458	*Cfr*10 I	1822	*Kpn* I	434	*Sca* I	2222
Acc I	473	*Ban* II	428	*Dra* II	2718	*Mam* I	457	*Sma* I	436
Afl III	849	*Bcg* I	2281	*Eam*1105 I	1742	*Nar* I	237	*Sph* I	488
Ahd I	1742	*Bpm* I	1812	*Ecl*136 II	426	*Nde* I	185	*Ssp* I	2546
*Alw*N I	1265	*Bsa*B I	457	*Eco*0109 I	2718	*Pst* I	482	*Xba* I	466
*Asp*700	2341	*Bsa* I	1803	*Hinc* II	474	*Sac* I	428	*Xma* I	434
*Asp*718	430	*Bsp*M I	485	*Hind* II	474	*Sal* I	472	*Xmn* I	2341
*Asp*E I	1742								

YB Rapid Ligation Kit

-20°C

 # FYC003-100R (100 rxns)

yT4 DNA Ligase	100 µl (3 U/µl)
10× Ligation Buffer A	200 µl
10× Ligation Buffer B	200 µl

Storage Buffer

Tris-HCl (pH7.5)	20 mM
KCl	50 mM
DTT	1 mM
EDTA	0.1 mM
Glycerol stabilizers	50%

10× Ligation Buffer A

Tris-HCl	0.4 mM
$MgCl_2$	0.1 mM
DTT	0.1 mM
ATP (pH5.0 at 25°C)	5 mM

The performance of this buffer depends on the integrity of ATP. Store the buffer in small aliquots at -20°C to minimize degradation of ATP and DTT

10× Ligation Buffer B

Buffer contains an enhancer which dramatically increases ligation efficiency for blunt end DNA

Related Products

- HiYield Plasmid Mini Kit 2.0 1-4
- HiYield Gel/PCR DNA Fragment Extraction Kit 2.0 1-5
- Gel Loading Dye Solution 1-11
- Agarose Standard 1-13
- *YE*Taq DNA Polymerase 2-1
- ECOS™ Competent Cells 3-1
- T&A™ Cloning Kit 3-12
- T&A™ Cloning Kit II 3-12

Description

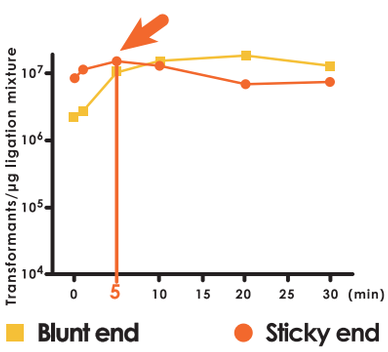
Yeastern's yT4 DNA ligase catalyzes the joining of two strands of DNA between the 5' – phosphate and the 3' – hydroxyl groups of adjacent nucleotides in either a cohesive-ended or blunt-ended termini. The enzyme also repairs single-strand nicks in duplex DNA, RNA or DNA/RNA hybrids. YB Rapid Ligation Kit is designed for efficient ligation of DNA inserts into vectors in just 5 minutes.

Features

- Either sticky- or blunt-end, ligation can be achieved within 5 minutes
- Reaction mixture can be used directly for bacterial transformation

Applications

- Join double-strand DNA with cohesive or blunt termini
- Join oligonucleotide linkers to DNA sequence with blunt end
- Repair nicks in duplex DNA, RNA, or DNA-RNA hybrids



Combo Products

Quality Control

Undetectable endo-deoxyribonuclease and exo-deoxyribonuclease activities, undetectable ribonuclease activity, undetectable degradation of labeled oligonucleotide, passed the test of the capability to join cohesive- and blunt-ended DNA fragments.

SCOS Transformation Kit

Description

The *SCOS* (***S****accharomyces* ***c****erevisiae* ***o***ne-***s***tep) Transformation Kit provides a simple and fast one-step / one-tube method for transforming the yeast, *S. cerevisiae* with a linear or circular plasmid DNA. The transformation efficiency varies based on the yeast strain used, the efficiency of plasmid incorporated into the host chromosome, the selection marker used and the transformation procedure. In general, the entire procedure can be completed in one hour, and routinely provides a transformation efficiency of 10^3 ~ 10^6 transformants/mg of plasmid DNA.

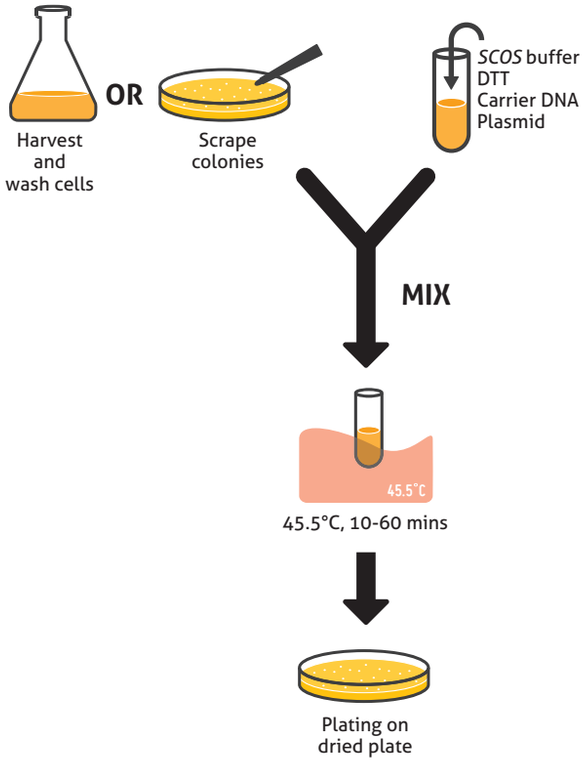
Features

- High throughput transformation
- Instant competent cell preparation
- An one-step, one-tube and 10~60 minutes protocol for transforming the baker's yeast (*Saccharomyces cerevisiae*)
- Simple (Mix → Heat shock → Plating)
- Suitable for yeast cells from colonies, broth or any growth phase
- Repeatable efficiency, always reach efficiency of 10^3 ~ 10^6 transformants/μg DNA

Applications

- Transformation of *S. cerevisiae*

Protocol



Quality Control

The transformation efficiency is checked in a lot-to-lot basis to ensure that it is above minimum 10^3 transformants/μg of plasmid DNA.

4°C

 # FYY101-120P (120 preps)

SCOS Transformation Buffer	12 ml
Carrier DNA	0.6 ml
DTT Powder	0.185 g

Related Products

- *YEA*taq DNA Polymerase 2-1
- O'in 1 DNA Polymerase Premix 2-3
- Accu DNA Polymerase 2-5
- HiFi DNA Polymerase 2-7
- RealStart DNA Polymerase Premix 2-9
- EZtime Real-Time PCR Premix 2-11
- Glass Plating Beads 3-22

YLEX Yeast Expression Kit

4°C

 # FYY201-1KT

Yarrowia lipolytica Yeast Strain: Po1g **(# FYY202-1SB)**	1 stab
pYLEX1 – Expression Vector **(# FYY203-5UG)**	5 µg
pYLSC1 – Secretion Vector **(# FYY204-5UG)**	5 µg
Primer 6560 F **(# FYY205-500UL)**	250 µl
Primer 6904 R	250 µl
YLOS Yeast Transformation Kit **(# FYY301-120P)**	1 kit

Description

YLEX Yeast Expression Kit based on INRA INAPG licensed patent* provides an easy approach for cloning and expressing a gene of interest in the yeast, *Yarrowia lipolytica*. Using this kit, high level of heterologous protein may be expressed intracellularly or be secreted from the cell into medium by selecting the supplied expression vector pYLEX1 or pYLSC1.

Vectors provided in the *YLEX* contain a strong hybrid promoter carrying four tandem copies of upstream activator sequences (UAS1B) fragment from p*XPR2* and a minimal p*LEU2* fragment. Unlike the frequently used *Yarrowia* promoter (p*XPR2*), this stable hybrid promoter directs protein expression constantly without multiple influences by nutritional and environmental factors in medium.

When a constructed plasmid with the hybrid promoter followed by a cloned gene of interest is linearized by the selected restriction enzyme, it becomes an expression cassette that can integrate into the *Y. lipolytica* genome by homologous recombination within the process of transformation. The successful transformants are ready for expression or secretion of recombinant protein depending on whether secretion signal appears on the plasmid.
For more information, please read the articles cited in this catalog.

** INRA (Institut National de la Recherche Agronomique) and INAPG (Institut National Agronomique Paris-Grignon*

Features

- **Safe:** *Y. lipolytica* was classified as GRAS (Generally Regarded As Safe) by the US FDA (Food and Drug Administration)
- **Simple:** a simple tool for expressing heterologous protein
- **Easy manipulation:** like *E. coli* and *S. cerevisiae*
- **Stable:** strong stability in vectors and constructed plasmids
- **Reliable:** vectors integrated at the same site in genome
- **Flexible:** both expression and secretion vector provided (proteins may be expressed intracellularly or be secreted from the cell into medium)
- **High growth ability:** high secretion capacity & high product yield
- **Less protein degraded:** no extracellular protease synthesized by a special protease-deficient Yarrowia strain
- **Mass production:** industrial mass production of recombinant proteins
- **Less hyperglycosylation:** able to perform post-translational processing of complex proteins, unlike *S. cerevisiae*

Applications

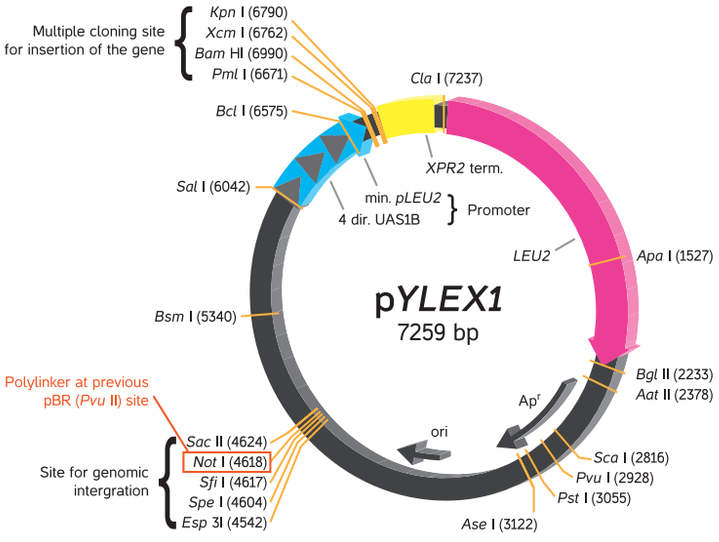
Heterologous protein expression, either intracellular or extracellular depends on selected vector in GRAS yeast.

Related Products

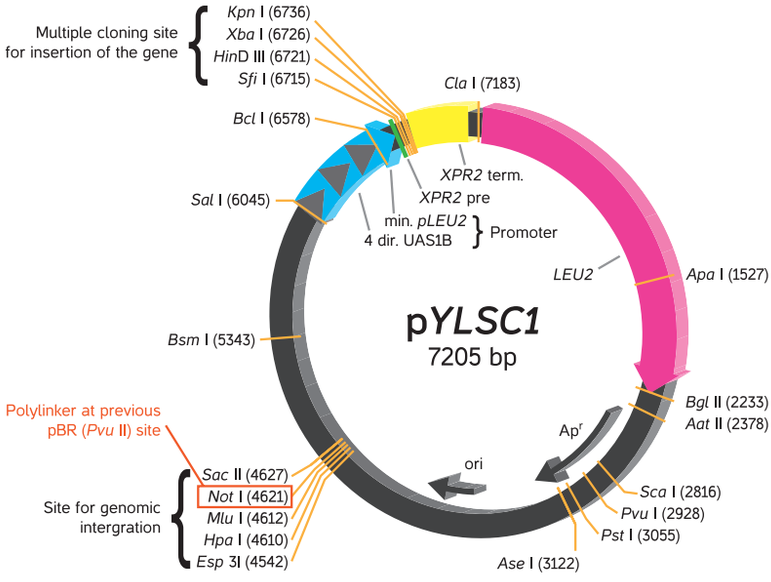
- HiYield Plasmid Mini Kit 2.0 1-4
- HiYield Gel/PCR DNA Fragment Extraction Kit 2.0 1-5
- Agarose Standard 1-13
- *YEA*taq DNA Polymerase 2-1
- O'in 1 DNA Polymerase Premix 2-3
- *Accu* DNA Polymerase 2-5
- HiFi DNA Polymerase 2-7
- RealStart DNA Polymerase Premix 2-9
- EZtime Real-Time PCR Premix 2-11
- dNTPs 2-22
- YB Rapid Ligation Kit 3-15
- *YLOS* Yeast Transformation Kit 3-21

Yarrowia Vectors

Two vectors (pYLEX1 and pYLSC1) are included in this kit, and they can be used for either intracellular expression or secretion of proteins of interest in *Y. lipolytica.* Generally speaking, if the target protein is cytosolic and non-glycosylated, the pYLEX1 vector is a better choice. If the protein of your interest is normally glycosylated or secreted, you may wish to choose the pYLSC1 vector.



The pYLEX1 expression vector (7259 bp) contains the strong hybrid promoter (hp4d) carrying four tandem copies of upstream activator sequences (UAS1B) fragment from p*XPR2* and a minimal p*LEU2* fragment. The multiple cloning site and the *XPR2* transcription terminator lie immediately downstream of 3′ site of hp4d promoter, followed by a leucine selection marker gene (*LEU2*). The vector can be linearized by digestion with *Not*I to create a linear DNA fragment capable of inserting into the *Y. lipolytica* genome.



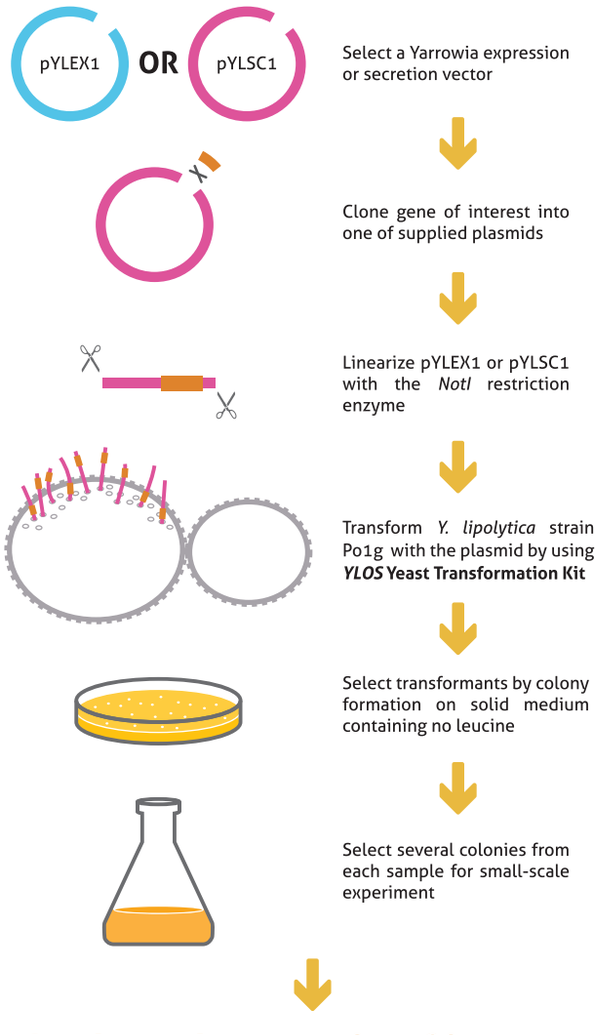
The pYLSC1 secretion vector (7205 bp) contains the hybrid promoter (hp4d) and a secretion signal (*XPR2* pre region). The multiple cloning site and the p*XPR2* transcription terminator lie immediately downstream of 3′ site of *XPR2* pre region, followed by a leucine selection marker gene (*LEU2*). The vector can be linearized by digestion with *Not*I to create a linear DNA fragment capable of inserting into the *Y. lipolytica* genome.

Yeast Strain

The strain Po1g of *Yarrowia lipolytica* is a derivative of the wild-type strain W29 (ATCC 20460) by a series of genetic modifications. Briefly, the original *URA3* gene in the W29 strain was disrupted with the *SUC2* gene from *Saccharomyces cerevisiae*, followed by the introduction of a deletion in the *LEU2* gene. Furthermore, the deletion of the *XPR2* and *AXP* genes ensures that Po1g is unable to produce any extracellular protease. In order to allow easy integration of pBR-based expression/secretion vectors, a pBR322 docking platform was integrated at the *URA3* locus.

Strain	Genotype	Phenotype
Po1g	*Mat*A, *leu*2-270, *ura*3-302::URA3, *xpr*2-332, *axp*-2	Leu-, ΔAEP, ΔAXP, Suc+, pBR platform

Protocol

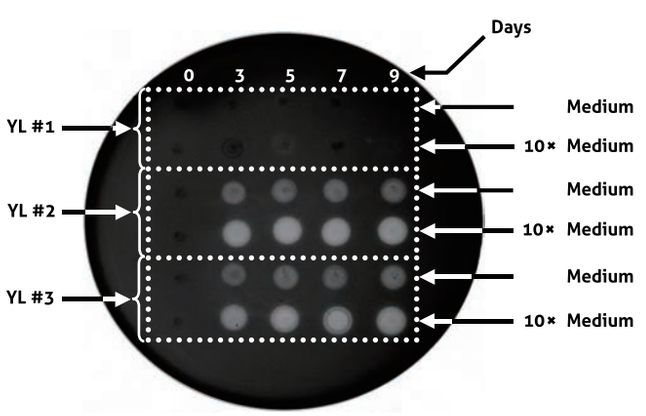


Quality Control

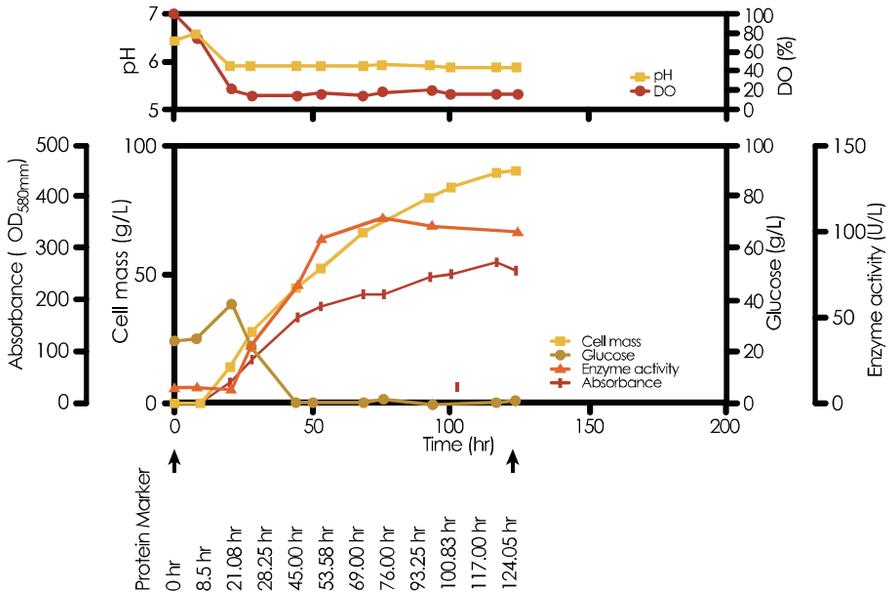
Two plasmids, pYLEX1+*AMY*1 (mouse salivary α-amylase gene) and pYLSC1+*AMY*1Δ (*AMY*1 without its native secretion signal) are used to ensure functional transformation kit and correct gene expression in the host. Contamination test is also performed to ensure no other microbial contamination.

Experimental Data

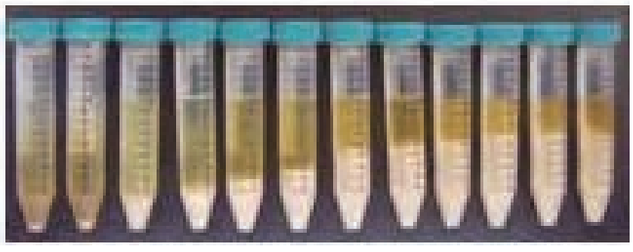
The figure shows that filtered culture medium from batch culture of both amylase-encoding transformants (YL #2 and #3) could digest starch in solid medium agar, and subsequently produce clear zones. In contrast, medium from the culture of yeast transformed with vector only (YL #1) did not exhibit the same result. It indicates that cloning of both a-amylase gene (AMY1) into pYLEX1 and a-amylase gene without its secretion signal peptide (AMY1D) into pYLSC1 was successful by using the *YLEX* Yeast Expression Kit. In both cases, active a-amylase was efficiently secreted into the culture medium.



A time course study of capacity of high cell density fermentation and secretion of recombinant enzyme in the *YLEX* system (*Yarrowia lipolytica* expression system).



Over production of heterologous protein (SDS-PAGE analysis):
Secretion profile of recombinant enzyme in supernatant, samples were collected by time course, 10 µl/lane.



High cell density fermentation:
High cell density fermentation in a 14L fed-batch fermenter, cells were centrifuged (3,000 rpm) by time-course.

*** *YLEX* Yeast Expression Kit (product spec.)**
Yarrowia lipolytica yeast strain: Po1g; pYLEX1- expression vector 1 stab; pYLSC1- secretion vector 5 µg; Primer 6560F (for sequencing purpose) 250 µl; Primer 6904F (for sequencing purpose) 250 µl; *YLOS* Yeast Transformation Kit 1 kit (120 rxns).

* *YLEX* Yeast Expression Kit is produced by **Yeastern Biotech Co., Ltd.** with patent protected, which is authorized with the non-exclusive manufacturing and distribution worldwide by the proprietary property of Institute National de la Recherche Agronomique (INRA), France.

YLOS Yeast Transformation Kit

4°C

 # FYY301-120P (120 preps)

YLOS Transformation Buffer	12 ml
Carrier DNA	0.6 ml
DTT Powder	0.185 g

Description

The *YLOS* (***Y****arrowia* ***l****ipolytica* ***o***ne-***s***tep) Yeast Transformation Kit provides a simple and fast one-step/one-tube method to transform *Yarrowia* cells cultured in either solid agar or liquid broth. They were designed for various strains of *Y. lipolytica* and vectors. Transformation efficiencies with *Y. lipolytica* will vary based on the yeast strain used, a linear or circular plasmid DNA, the efficiency of plasmid integration into the host chromosome, and the transformation procedure chosen. Generally, the entire procedure may be completed in 60 mins, and routinely provides a transformation efficiency of 10^3 ~ 10^5 transformants/μg of plasmid DNA.

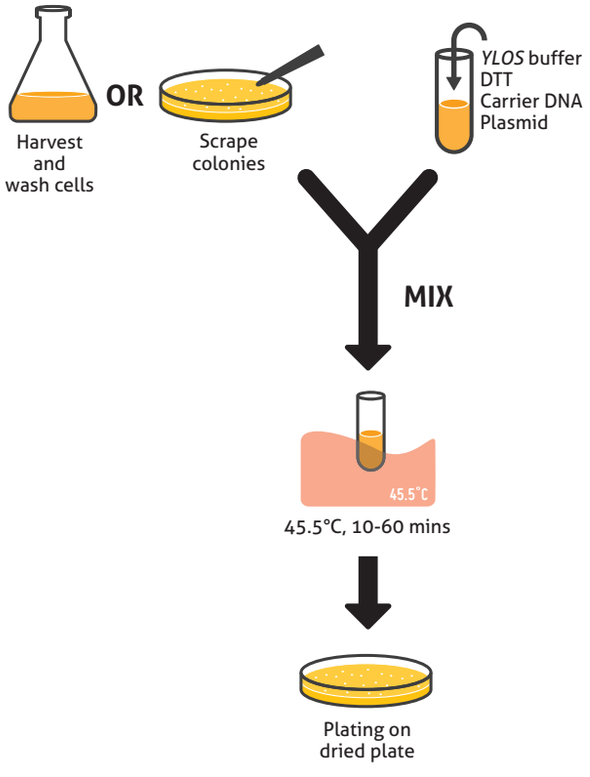
Features

- Instant preparation of competent cells
- An one-step, one-tube and 10 ~ 60 minutes protocol for transforming
- The oleaginous yeast, *Yarrowia lipolytica*
- Simple (Mix → Heat shock → Plating), suitable for *Yarrowia* yeast
- Cells from colonies, broth or any growth phase
- Repeatable efficiency, always reach efficiency of 10^3 ~ 10^5 transformants/μg DNA

Applications

- Transformation of *Y. lipolytica*

Protocol



Quality Control

The transformation efficiency with the plasmid pYLEX1is checked in a lot-to-lot basis to ensure that it is above minimum 10^3 transformants/μg of plasmid DNA.

Related Products

- HiYield Plasmid Mini Kit 2.0 1-4
- HiYield Gel/PCR DNA Fragment Extraction Kit 1-13
- Agarose Standard 1-13
- *YEA*taq DNA Polymerase 2-1
- O'in 1 DNA Polymerase Premix 2-3
- *Accu* DNA Polymerase 2-5
- HiFi DNA Polymerase 2-7
- RealStart DNA Polymerase Premix 2-9
- EZtime Real-Time PCR Premix 2-11
- dNTPs 2-22
- YB Rapid Ligation Kit 3-15
- *YLEX* Yeast Expression Kit 3-17

Glass Plating Beads (Sterilized)

Description

Sterilized glass plating beads (4 mm) provide an efficient and easy method to achieve optimal spreading on agar plates. The rolling action of the glass beads gently spread the *E. coli* solution (or any bacterial/fungal solution) to reach areas of the plate that are inaccessible to spread. Multiple plates containing beads and *E. coli* solution may be stacked and shaken simultaneously to increase spreading throughout and reduce cell stress. The beads may be recovered by washing with 70% ethanol, then sterilized and dried.

Features

- Pre-sterilized
- No flaming required

Applications

- Bacterial and fungal solution spreading on agar plates
- Plating yeast for two-hybrid screens

Protocol

For regular plating of ECOS™ Competent Cells, add 5 ~ 10 beads immediately after pipetting 50 ~ 100 µl of transformed cells onto each plate. Move the plate back and forth to roll the beads on the surface and change the direction of shaking a few times to ensure even spreading. When the surface of the agar starts to dry on the plate (20 ~ 40 seconds), pour off the beads and the plates are ready for incubation.

- Pre-warmed glass beads at 37°C for ECOS™ warm plating (protocol 2&4, page3-2 protocol)
- Pre-cooled glass beads at 4°C for ECOS™ cold plating (protocol 1&3, page 3-2 protocol)
- Room temperature for *SCOS* and *YLOS* Yeast Transformation Kits

Quality Control

Each lot of beads has to pass contamination test by spreading sterilized water on agar plates containing no selective antibiotics. No bacterial and fugal colonies should be seen after 2 days incubation.

RT

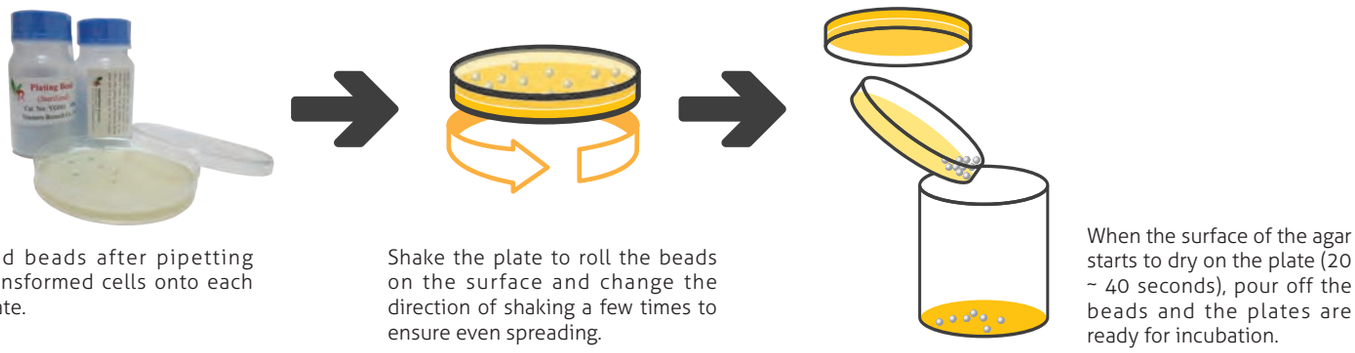
 # FYO001-100G

Sterilized, 4 mm 100g

Related Products

- ECOS™ Competent Cells 3-1
- *SCOS* Transformation Kit 3-16
- *YLEX* Yeast Expression Kit 3-17
- *YLOS* Yeast Transformation Kit 3-21

Protocol



Add beads after pipetting transformed cells onto each plate.

Shake the plate to roll the beads on the surface and change the direction of shaking a few times to ensure even spreading.

When the surface of the agar starts to dry on the plate (20 ~ 40 seconds), pour off the beads and the plates are ready for incubation.

Proteomics

Sharp Protein Marker III

-20°C

 # FYP006-500UL
Sharp Protein Marker III 500 µl

Description

The prestained Sharp Protein Marker III is 3-color prestained recombinant protein standards consists of 12 proteins from 10 kDa to 315 kDa. The marker mix is pre-denatured and stabilized in loading buffer, so no additional boiling is necessary before loading onto SDS-PAGE gels.

Features

- **Crystal clear :** Sharp bands and stable colors
- **Multicolor :** easy to track on gel
- **Ready-to-load :** no need to boil
- Excellent Western transfer

Applications

- Monitoring protein migration during SDS-PAGE
- Monitoring protein transfer onto membranes during Western blotting
- Approximate sizing of proteins on SDS-PAGE gels
- Acrylamide gels and Western blots

Notes

- The ladder contains two green reference bands at ~50 kDa and 10 kDa and one orange reference band of 70 kDa.
- Avoid multiple freeze/thaw cycles.
- Lot-to-lot variation of the apparent molecular weight of prestained proteins is <10% depending on the molecular weight.
- Western blotting of large (>100 kDa) proteins may need longer transfer times or higher transfer voltages for efficient transfer.

Quality Control

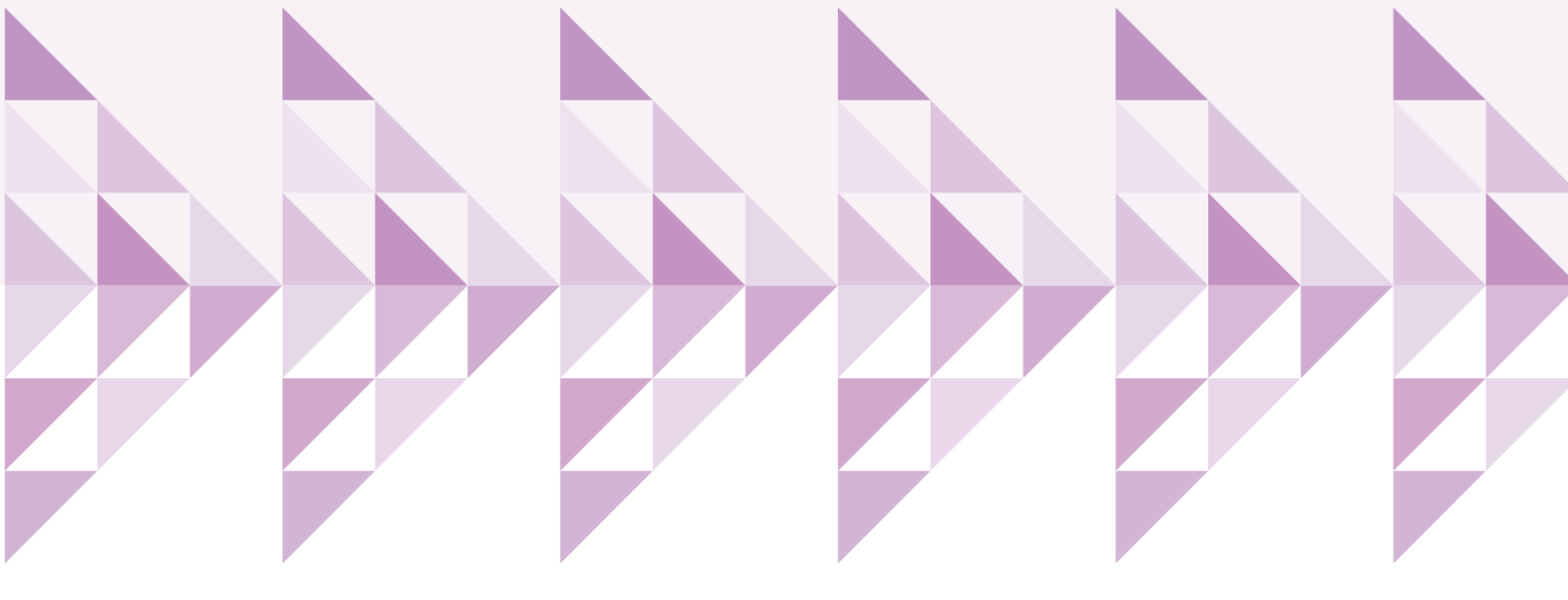
5 µl of Sharp Protein Marker III provide expected numbers of bands of equal intensity in SDS-PAGE (Tris-glycine buffer) and after electrotransfer onto a PVDF membrane.

Recommendation for Loading

- Apply 5 µl/well on mini gels and 10 ~ 15 µl/well on large gels
- For blots, apply 1 ~ 3 µl/well on mini gels and 2 ~ 6 µl/well on large gels

Mini gel loading volume: 5 µl/well
4~20% SDS-PAGE Gel

Note



OEM Services & Appendix

Competent Cells

Description

We are the world's leading competent cells manufacturing biotechnology company, providing customers from all over the world with reliable and quality competent cells. Yeastern Biotech Co., Ltd. owns the patent of ECOS™ technology (including protocol) exclusively in Canada **(TMA622,671)**, USA **(US 6,864,088, US 7,098,033, US 7,820,443)**, UK **(GB2383582)**, German **(Nr. 102 51 429)**, France **(FR 2832727)**, Taiwan **(I 229696)**, China **(ZL 2005 1 0112590.8)**, Korea **(0604787, 10-1350283)**, and Japan **(4867595)**. Under the patented protocol, transformation with our ECOS™ chemically competent cells can be finished in one step within one minute without the need for SOC recovery step. Therefore, ECOS™ competent cells are the fastest transforming cells worldwide.

In order to meet customer needs, we provide OEM of *E. coli* competent cells using our ECOS™ technology. Any *E. coli* strain can be prepared to become ECOS™ competent cells which can be transformed using our patented protocols. Customers will only need to send the *E. coli* strain to us along with information of its genotype and note for basic culture conditions. Typically, the total procedure can be finished in 30-60 days. However, a minimum order of 160 tubes (100 µl/tube) is required for this service.

Forensic / Diagnostic Kits

Description

Yeastern Biotech Co., Ltd. owns a ISO13485:2003 certified GMP factory, thus is able to help customers develop any detection kit for forensic or diagnostic purposes based on our UniversAll™ Tissue Extraction kit and PCR premix or qPCR premix. The use of UniversAll™ Extraction kit greatly reduces the processing time during DNA extraction, from 1-2 hours to only 10 minutes. The choice of our PCR premix or qPCR premix gives the highest specificity and sensitivity to meet the criteria of forensic/diagnostic analyses.

Molecular Biology Kits

Description

Yeastern have completed many OEM requests on the development of molecular biology kits, such as competent cells, DNA ladders, DNA polymerases, PCR premixes, RT-PCR premixes, qPCR premixes, pre-stained protein markers, fast DNA detection or diagnostic kits. We sincerely contribute our technologies through OEM services to satisfy customers' requirements.

Human Fab Phage Display Library

Description

Yeastern Biotech provides human Fab phage display libraries against academic, therapeutic and diagnostic targets for biomedical and pharmaceutical clients. Our service include: naïve Fab antibody libraries, selection of binders through phage display panning and screening, sequence analysis and lead selection, affinity maturation and mammalian cell expression.

Yeast Genetic Engineering

Saccharomyces cerevisiae

Yeastern's genetic engineering system with food-grade baker's yeast (*Saccharomyces cerevisiae*) mutants (patent pending) enables secretion or accumulation of high-quality heterologous proteins at either analytical or industrial scales. It is designed to lessen the risk and cost of pharmaceutical and biotechnology companies in high-quality protein production. Currently, we have completed the design and production of more than 20 proteins (peptide hormones, transmembrane proteins, industrial enzymes, nucleic acid binding proteins, drug proteins, viral antigens), and most have shown low glycosylation and high production. For our own, we have successfully produced herbal immunomodulatory proteins and algal SOD using this technology.

Yarrowia lipolytica

Yarrowia lipolytica is classified as GRAS (Generally Regarded As Safe) by the US FDA (Food and Drug Administration). *Y. lipolytica*, like *E. coli* and *S.cerevisiae*, can be manipulated easily and produces proteins with less hyperglycosylation. *Y. lipolytica* genetic engineering system is based on our *YLEX* Yeast Expression Kit, by which high level of heterologous proteins can be expressed intracellularly or be secreted from cells into the medium depending on customers' desires.

Educational Packs

Description

Yeastern manufactures a series of molecular biology products from nucleic acid extraction, amplification to gene cloning. We are able to OEM user-friendly educational packs, aiming to give high school and undergraduate students a fundamental knowledge of life science thus increase their interests in further exploring the fun and excitement of science!

Competent Cells Information

Transformation Efficiency

- Equation for transformation efficiency= transformed colonies (transformants) / μg of plasmid
- **Example :**
  100 μl of competent cells have been transformed with 10-6 μg of pUC19 plasmid. If 550 colonies are observed on the selective plate. The transformation efficiency is:

$$500 / 10^{-6} = 5.5 \times 10^{8} \text{ transformants / μg of pUC19 plasmid}$$

Genotype

Product Name	Strain	Genotype
ECOS™ X / ECOS™ 101	DH5α	F⁻ endA1 hsdR17(rk⁻, mk⁻) *supE44 thi-1 λ⁻ recA1 gyrA96 relA1 Δ(argF-lacZYA)*U169 Φ80d *lacZ* ΔM15 *deoR*
ECOS™ 9-5	JM109	F' *traD36 proA⁺ proB⁺ lacIq Δ(lacZ)*M15 *Δ(lac-proAB) supE44 hsdR17 recA1 gyrA96 thi⁻1 endA1 relA1 e14⁻ λ⁻*
ECOS™ Blue	XL1-Blue	F' *recA1 endA1 gyrA96 thi⁻1 hsdR17*(rk⁻, mk⁺) *supE44 λ⁻ Δ(lac) proAB lacIqZ*ΔM15 *Tn10 (tetʳ)*
ECOS™ 21	BL21(DE3)	F⁻ *hsdS gal (λ cIts857 ind1 Sam7 nin5 lacUV5-T7 gene I)*
ECOS™ 10B	DH10B	F⁻ *endA1 recA1 galE15 galK16 nupG rpsL ΔlacX74* Φ80d *lacZ* ΔM15 *araD139 Δ(lara,leu)7697 mcrA Δ(mrr⁻hsdRMS⁻mcrBC) λ⁻*
ECOS™ 2163	GM2163	F⁻ *ara⁻14 leuB6 thi⁻1 fhuA31 lacY1 tsx⁻78 galK2 galT22 supE44 rpsL136(strr) xyl⁻5 mtl⁻1 dam13:Tn9 (camr) dcm⁻6 mcrB1 hsdR2*(rk⁻mk⁺) *mcrA*

Nomenclature & Abbreviations

Gene	Description
araD	Arabinose metabolism is blocked due to mutation in L-ribulose-phosphate 4-epimerase.
dam	Elimination of endogenous adenine methylation at GATC sequences.
dcm	Elimination of endogenous cytosine methylation at CCWGG sequences.
DE3	A λ prophage carrying the T7 RNA polymerase gene and $lacI^{q}$.
deoR	A regulatory gene that allows constitutive expression of deoxyribose synthesis genes; permits uptake of large plasmids.
endA	Eliminate the nonspecific activities digestion of Endonuclease I to obtain a cleaner preparation of DNA.
e14	Excisable prophage-like element, containing mcrA gene, present in K-12 but missing from many derivatives.
F	The F plasmid, a low-copy number and self-transmissible plasmid.
fhuA	Resistance to phage T1 (ferric hydroxamate uptake) due to mutation in iron uptake receptor.
gal	The ability to metabolize galactose is eliminated.

Gene	Description
galE	A mutation which prevents the production of UDP-galactose, increased resistance to phage P1 infection and 2-deoxygalactose. *gal*E15 is a point mutation resulting in a Ser123 → Phe conversion.
galK	A mutation which prevents the metabolization of galactose and are resistant to 2-deoxygalactose. *gal*K16 is an IS2 insertion downstream of the galK start codon.
gyrA	Resistance to the antibiotic nalidixic acid due to a point mutation in DNA gyrase, subunit A.
hsdR, hsdS	DNA without methylation of certain sequences will be recognized as foreign and degraded by EcoK I or EcoB I. hsdR and hsdS recognize different sequences and are encoded by different alleles of hsdRMS. hsdR mutations eliminate restriction but not protective methylation (r-m+), while hsdS mutations eliminate both (r-m-).
lacI^q	Mutation of -35 site in upstream promoter of *lacI*, causing overproduction of *lac* repressor, result in turning off expression from Plac more completely.
lacZ	β-galactosidase activity is eliminated.
lacZΔM15	Deletion mutation of the lacZ gene (a.a. 11~41) that allows α complementation of the β-galactosidase gene; required for blue/white selection on XGal plates.
lacY	Lactose permease activity eliminated.
lon	Elimination of a protease activities responsible for degrading aberrant proteins.
mcrA	Mutation eliminating restriction of DNA methylated at the sequence C^{M}CGG.
mtl	The ability to metabolize the sugar alcohol mannitol is eliminated.
ompT	Activity of outer membrane protease VII is eliminated, reducing proteolysis of expressed protein.
phoA	Activity of alkaline phosphatase is eliminated.
recA	Reduce unwanted homologous recombination.
relA	Permits RNA synthesis in the absence of protein synthesis.
rfbD	Unable to synthesis cell surface O-antigen as lack of functional TDP-rhamnose synthetase.
rpsL	Mutation in ribosomal protein S12 conveying streptomycin resistance.
supE	A tRNA functioning in suppressing the amber (UAG) stop codon by insertion of glutamine; required for growth of some phage vectors.
thi-1	The ability to synthesize thiamine (vit. B1) is eliminated.
Tn10	Transposon normally carrying Tetracycline resistance.
tsx	Resistance to bacteriophage T6 and colicin K.
(Φ80)	Strain carries the lambdoid prophage Φ80. A defective Φ80 prophage carrying the lac M15 deletion is present in some strains.

Nucleic Acids & Amino Acids Information

Concentration of Nucleic Acids

- **dsDNA (double-stranded DNA) :** 1 OD260 Unit = 50 µg/ml
- **ssDNA (single-stranded DNA) :** 1 OD260 Unit = 37 µg/ml
- **ssRNA (single-stranded RNA) :** 1 OD260 Unit = 40 µg/ml
- **dsDNA (double-stranded DNA) :** 1 OD260 Unit = 50 µg/ml
- **single-stranded oligonucleotides :** 1 OD260 Unit = 20 µg/ml

Molecular Weight Conversion of Nucleic Acids

- **Exact M.W. of ssRNA :**
  M.W. = $(A_x \times 329.2) + (U_x \times 306.2) + (C_x \times 305.2) + (G_x \times 345.2) + 159$*
  X : the number of each respective nucleotide within the polynucleotide.
  * : M.W. of a 5' triphosphate.

- **Exact M.W. of ssDNA :**
  M.W. = $(A_x \times 313.2) + (T_x \times 304.2) + (C_x \times 289.2) + (G_x \times 329.2) + 79.0$*
  X : the number of each respective nucleotide within the polynucleotide.
  * : M.W. of the 5' monophosphate left by most restriction enzymes. No phosphate is present at the 5' end of strands made by primer extension.

Molecular Weight of Amino Acids

Amino Acid	3-letter Code	1-letter Code	Molecular Weight (g/mol)
Alanine	Ala	A	89.1
Arginine	Arg	R	174.2
Asparagine	Asn	N	132.1
Aspartate	Asp	D	133.1
Cysteine	Cys	C	121.2
Glutamate	Glu	E	147.1
Glutamine	Gln	Q	146.2
Glycine	Gly	G	75.1
Histidine	His	H	155.2
Isoleucine	Ile	I	131.2

Amino Acid	3-letter Code	1-letter Code	Molecular Weight (g/mol)
Leucine	Leu	L	131.2
Lysine	Lys	K	146.2
Methionine	Met	M	149.2
Phenylalanine	Phe	F	165.2
Proline	Pro	P	115.1
Serine	Ser	S	105.1
Threonine	Thr	T	119.1
Tryptophan	Trp	W	204.2
Tyrosine	Tyr	Y	181.2
Valine	Val	V	117.1

Gel Information

Agarose Gel

% Agarose	Effective Range of Separation (bp)
0.5	1,000 to 30,000
0.7	800 to 12,000
1.0	500 to 10,000
1.2	400 to 7,000
1.5	200 to 3,000
3-4	10 to 1000

Polyacrylamide Gel (Denaturing Gel)

% Acrylamide	Effective Range of Separation (nucleotides)
3.5	> 500
5	151-500
10	61-150
15	30-60
20	< 30

Buffer Recipes

1× TE Buffer

Material	5 ml	1 l	10 l
1 M Tris HCl	5 ml	10 ml	100 ml
500 mM EDTA	1 ml	2 ml	20 ml
ddH_2O	Bring the volume to 500 ml	Bring the volume to 1 l	Bring the volume to 10 l

Adjust the pH to 8.0 and store at 4°C.

50× TAE Buffer

Material	200 ml	500 ml	1 l
2 M Tris Base	48.44 g	121.1 g	242.2 g
0.5 M EDTA	3.72 g	9.31 g	18.62 g
1 M Acetic Acid	14.42 ml	28.55 ml	57.1 ml
ddH_2O	Bring the volume to 200 ml	Bring the volume to 500 ml	Bring the volume to 1 l

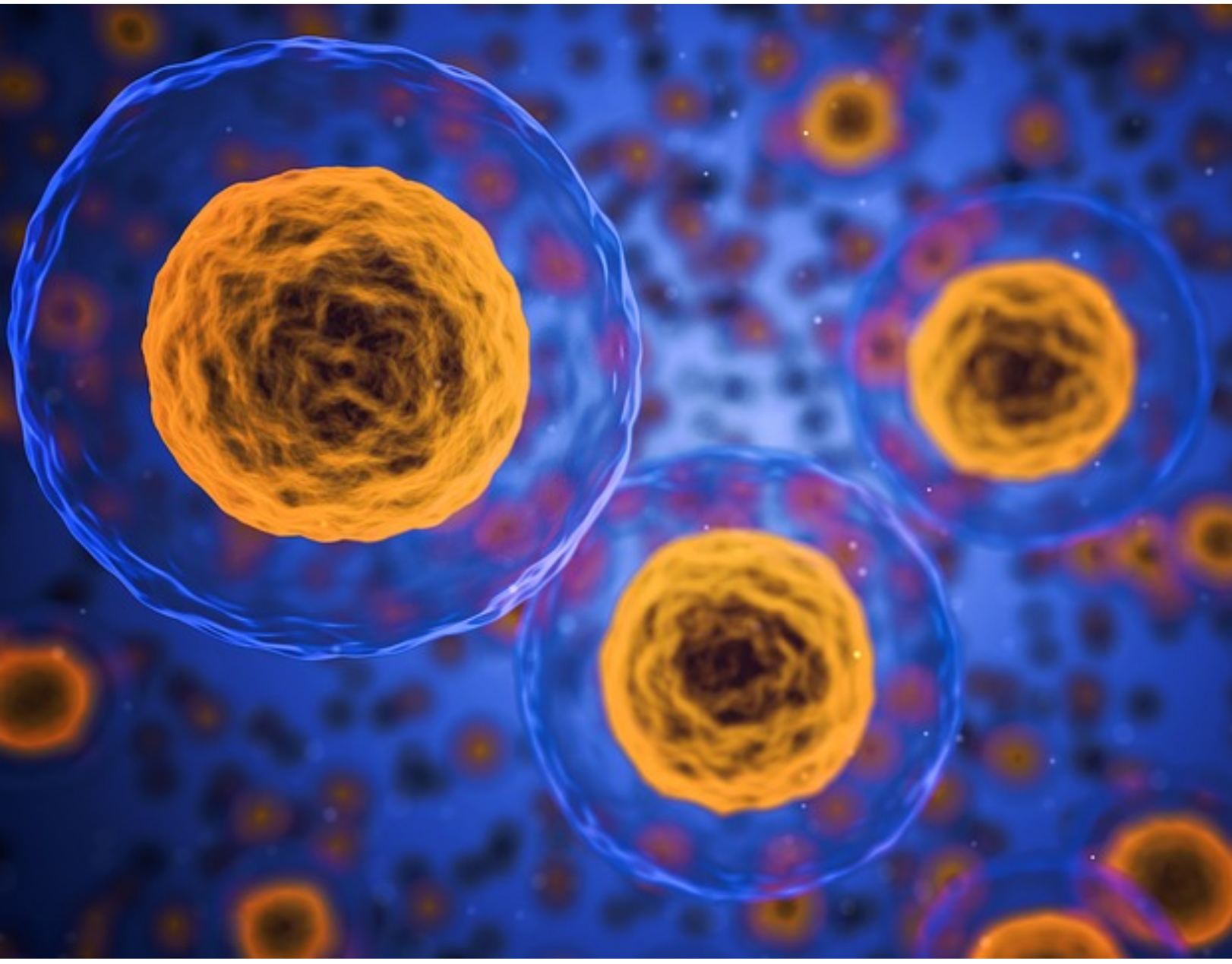
Adjust the pH to 7.6 and store stock solution at 4°C.

LB Medium

Material	100 ml	500 ml	1 l
2 M Tris Base	1 g	5 g	10 g
0.5 M EDTA	0.5 g	2.5 g	5 g
1 M Acetic Acid	1.0 ml	5.0 ml	10 ml
ddH_2O	Bring the volume to 100 ml	Bring the volume to 500 ml	Bring the volume to 1 l

Adjust the pH to 7.0 and store at 4°C.

Note



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