



Gene Synthesis



- Tsynth® Gene Synthesis
- DNA Fragment
- Plasmid Preparation

- PCR cloning & Subcloning
- Mutagenesis



Tsingke has a complete industrial chain in nucleic acid synthesis specializing in the development & manufacturing of genomics and biosynthesis products. Tsingke’s wide-ranging expertise and specialized platforms offering total solutions from raw materials and equipment to synthetic products and services.

With industry-leading DNA synthesis platform, Tsingke offers high-quality genes (up to 200 kb) and DNA fragments with advanced Tsynth® synthesis technology that are suitable for a variety of applications. Genes are provided with Tsingke cloning vectors or custom vector of your choice without cloning fees.



Advantages



Tsynth® Gene Synthesis

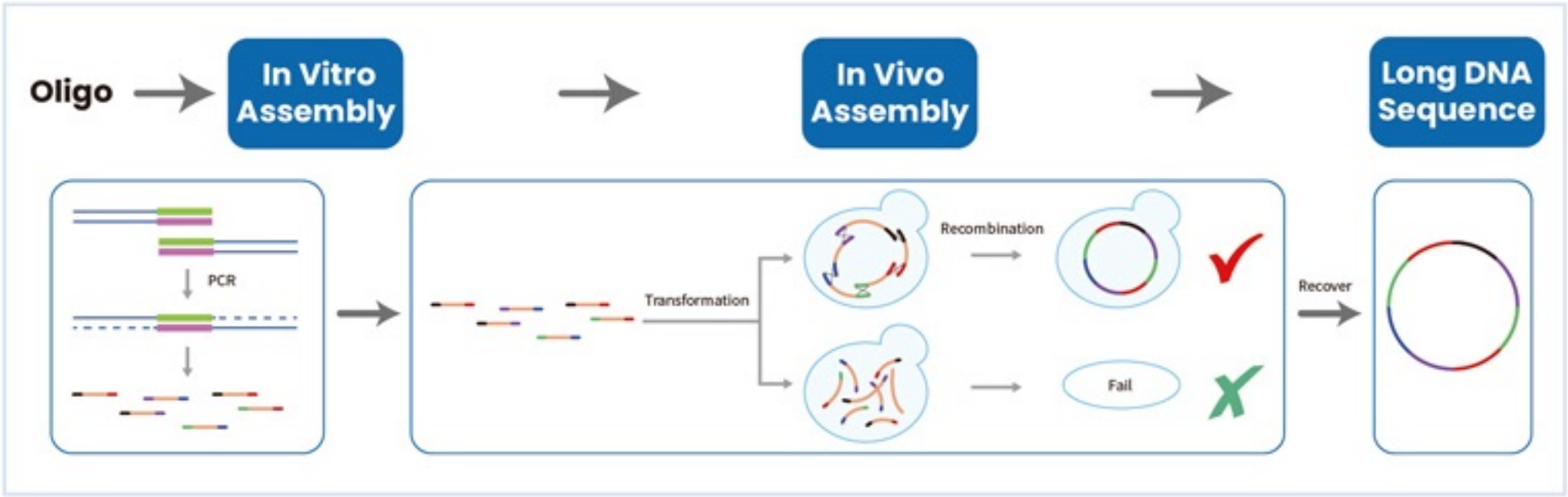
· Standard Gene Synthesis

Length	Turnaround time (Calendar day)*	Vector
< 1.5 kb	5~8	Any vector; If not specified otherwise, default to using pUC57.
1.5 kb~3 kb	7~11	
3 kb~6 kb	10~15	
6 kb~8 kb	15~22	
> 8 kb	Evaluation	

*Turnaround Time for simple sequences only and may change with the complexity of the gene sequence. Get your accurate estimated turnaround time by emailing info@tsingke.com.cn

· ProLong Gene

Length	Turnaround time (Calendar day)	Vector
> 10 kb	Evaluation	pCC1413



Long Fragment and Genome Synthesis Based on Saccharomyces Cerevisiae System.

DNA Fragment

Length	Turnaround time (Calendar day)
100 bp~1.2 kb	2~3

PCR cloning &Subcloning

Length	Turnaround time (Calendar day)
< 1.5 kb	7~10
1.5 kb~3 kb	7~11
3 kb~6 kb	10~15
6 kb~8 kb	13~18
> 8kb	Evaluation

Mutagenesis

Length	Turnaround time (Calendar day)
< 1.5 kb	7~10
1.5 kb~3 kb	7~11
3 kb~6 kb	10~15
6 kb~8 kb	13~18
> 8kb	Evaluation

Plasmid Preparation

• Research Grade

Service Details		
Volume	Turnaround time(Calendar Day)*	Deliverables
100 µg	5	Prepared lyophilized plasmid DNA; Sequencing map (.abi file); COA Report(electronic).
200 µg	6	
500 µg	8	
1 mg	8	
2 mg	9	
3 mg	10	
4 mg	11	
5 mg	12	
10 mg	15	
20 mg	16	
50 mg	17	
100 mg	21	

*Opt for Gene Synthesis Alongside Plasmid Preparation and Save 2 Days on Turnaround Time.

Quality Control			
Research Grade	Items	Method	Specifications
	Appearance	Visual inspection	Colorless Liquid of Pure Transparency
	A260/280 ratio	UV Absorbance	1.8~2.0
	Supercoil content	Agarose gel electrophoresis	> 50%
	Concentration	UV Absorbance	90%~110%
	Residual DNA	Agarose gel electrophoresis	Not visible
	Residual RNA	Agarose gel electrophoresis	Not visible
	Restriction enzyme analysis	Agarose gel electrophoresis	Adjustable according to requirement
	Sequence verification	Sanger sequencing	Consistent with the confirmed plasmid sequence

• Transfection Grade

Service Details			
Endotoxin	Volume	Turnaround time(Calendar Day)*	Deliverables
< 0.1 Eu/ μg < 0.01 Eu/ μg < 0.005 Eu/ μg	100 μg	5	Prepared lyophilized plasmid DNA; Sequencing map (.abl file); COA Report(electronic).
	200 μg	6	
	500 μg	8	
	1 mg	8	
	2 mg	9	
	3 mg	10	
	4 mg	11	
	5 mg	12	
	10 mg	15	
	20 mg	17	
	50 mg	19	
	100 mg	22	

*Opt for Gene Synthesis Alongside Plasmid Preparation and Save 2 Days on Turnaround Time.

Quality Control			
Transfec- tion Grade	Items	Method	Specifications
	Appearance	Visual inspection	Colorless Liquid of Pure Transparency
	A260/280 ratio	UV Absorbance	1.8~2.0
	Supercoil content	Agarose gel electrophoresis	> 85%
	Concentration	UV Absorbance	90%~110%
	Residual DNA	Agarose gel electrophoresis	Not visible
	Residual RNA	Agarose gel electrophoresis	Not visible
	Restriction enzyme analysis	Agarose gel electrophoresis	Adjustable according to requirement
	Sequence verification	Sanger sequencing	Consistent with the confirmed plasmid sequence
	Endotoxin	Limulus ameobocyte lysate (LAL) test	Endotoxin ≤ Standard
	Exogenous Contami- nation Detection	NGS(Depth > 30×)	Genomic DNA < 1% Other DNA Contamination < 0.1%

Application

DNA
vaccine research

Virus packaging

Antibody
discovery

Gene and cell therapy studies



In vitro
transcription

Casestudy

- Quality Control



Fig 1.1 Single colonies

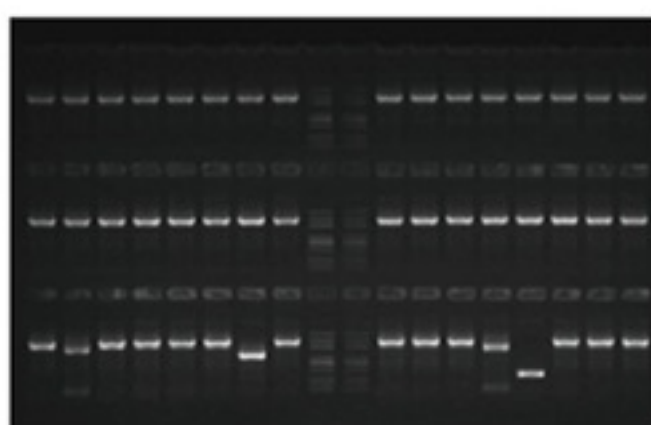


Fig 1.2 PCR identification

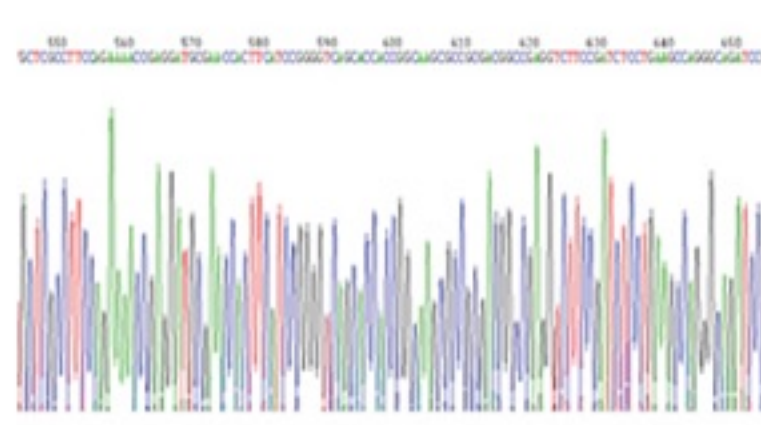


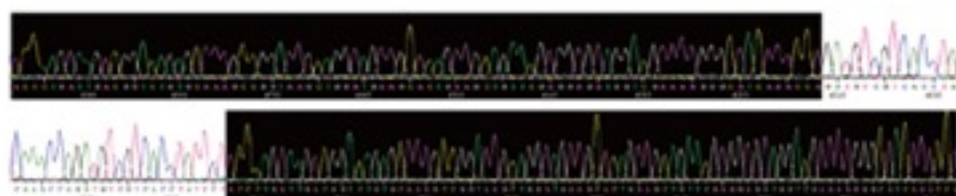
Fig 1.3 Sanger sequencing verification

- Sophisticated Cases

1. Continuous unit repetition

[illegible]

DNA sequence

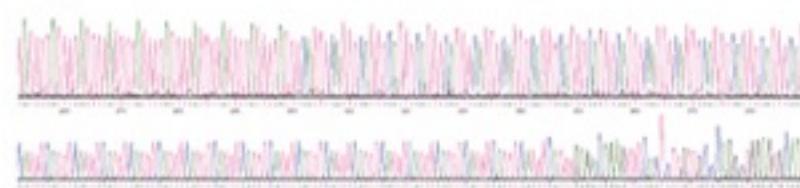


Results

2. Small segment repetition

[illegible]

DNA sequence

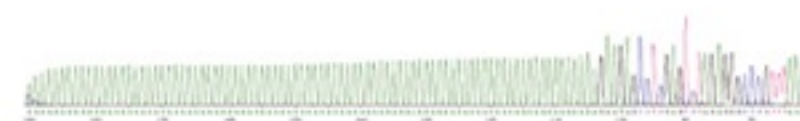


Results

3. Poly(A) structure

AA
 AAAGAGAGCCTCGAG
 TCTAGAGGGCCCGTTTAAACCCGCT

DNA sequence



Results

4. High GC% structure

GGGGGGGCGCGCGCAGCGGGGCGGGCGGGCGAGGGCGGGGCGGGCGAGGCGGAGAGAGTGTGGCGGCAGC
CAATCAGAGCGGGCGCGTCCGAAGTTTCTTTATCGAGGCGGGCGGGCGGGCGGGCGTATAAAGAGGAGCGCGC
GGCGGGCGGGAGTGCTGCGGCGTGCTTCGCCGCCGTCGCCCGCTCCGCCGCCCGCCGCCGCCCGGCTGTG
ACTGACCGCGTTACTCCACAGGTGCGCGGGGAGCAGCCCGCGCTTCGGGTGCGGGGCTCCGTACGGGGCTGG
CGCGGGGCTGCGGTGCTGCGGGGGGGTGGCGAGCGCGGGGTGCGCGGGGCGGGCGGGGCGCTCGCGGGCGGGG
AGGCGTCGGGGGAGGGCGGCGGCGGCCCGGAGCGCGGGGCTGTGAGGCGGGCGGCGAGCCGCGACGC

DNA sequence

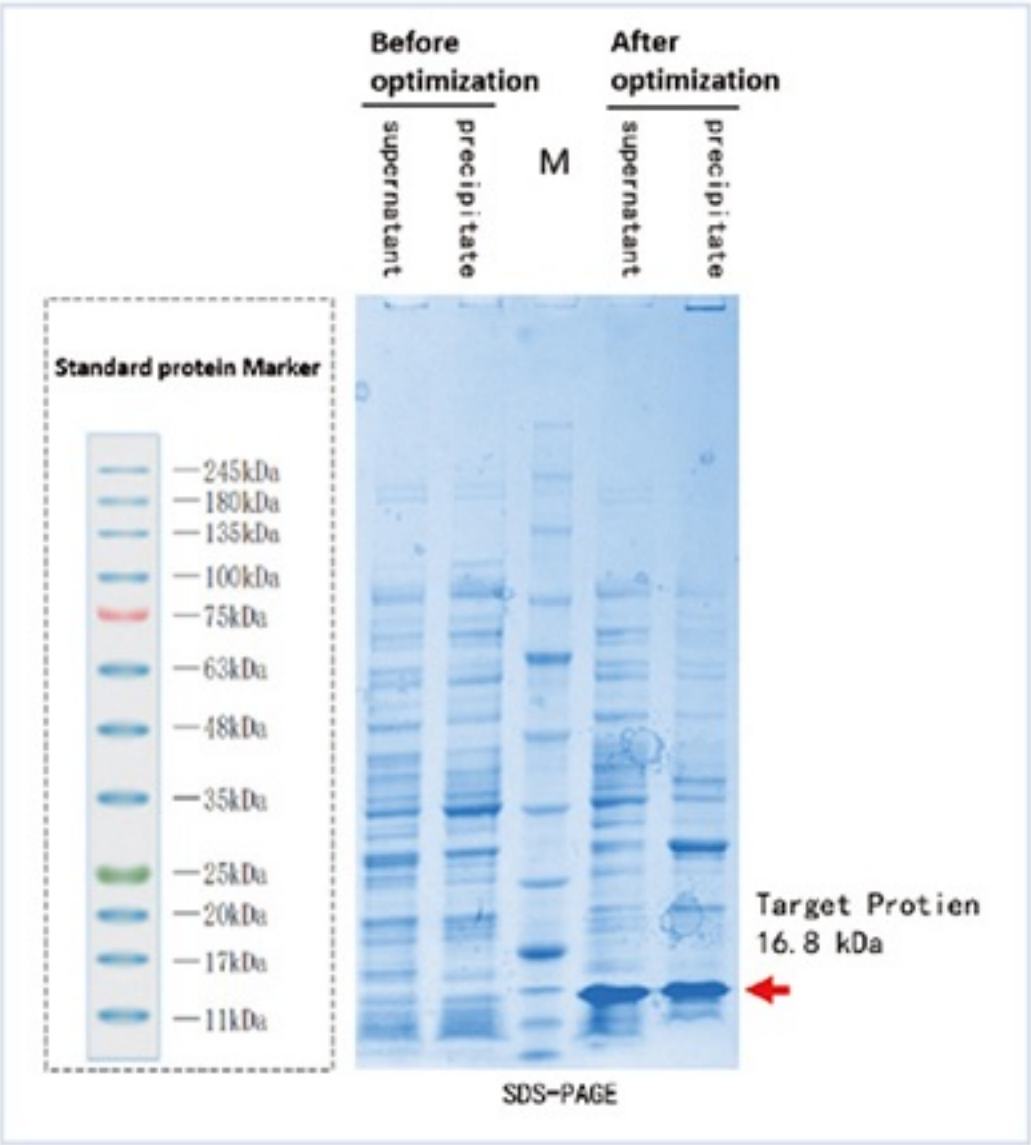


Results

• Codon Optimization

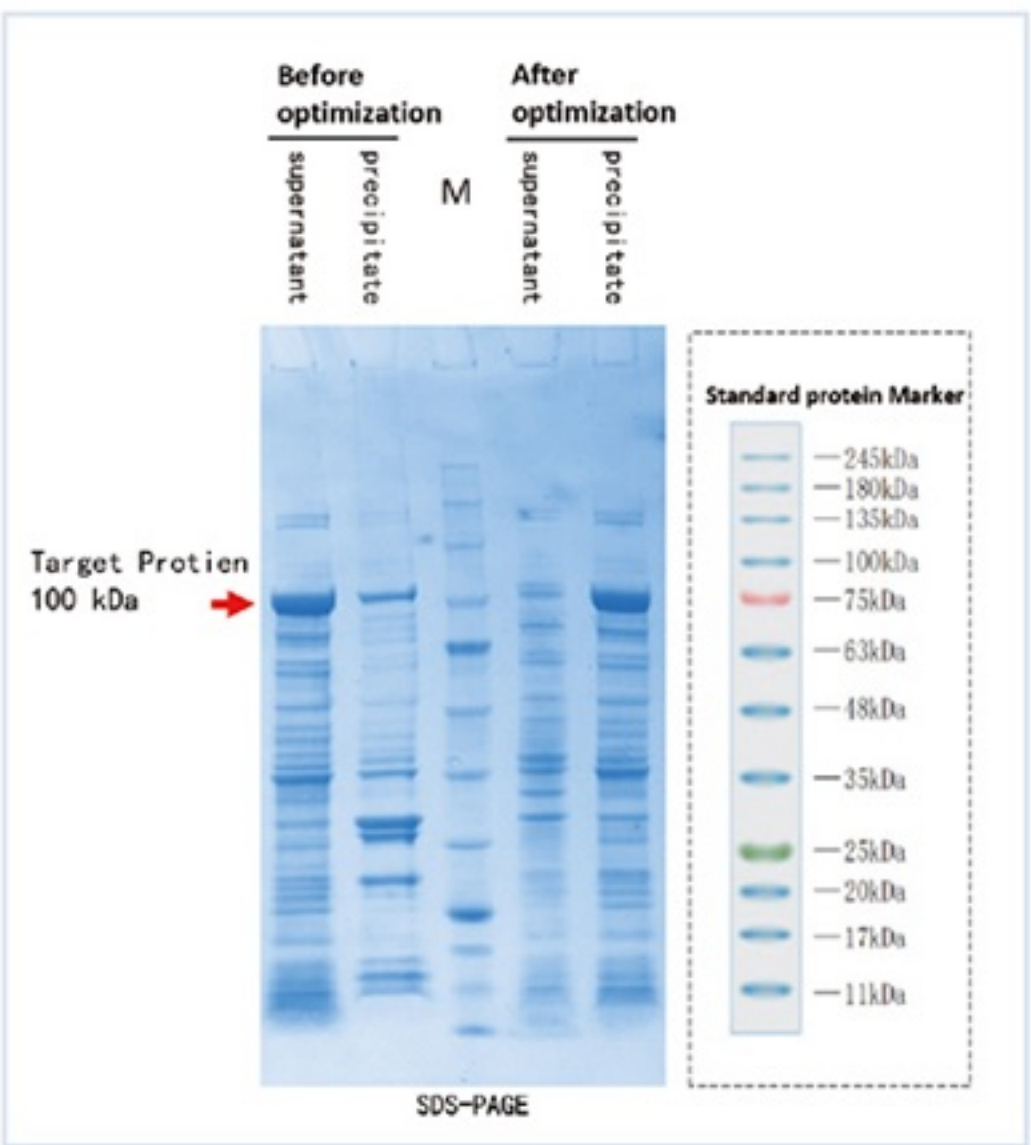
(1) Enhanced protein expression after cryptographic optimization

The target protein 16.8kDa was not expressed before codon optimization, but was highly expressed after codon optimization.



(2) Cryptographic optimization enhances protein soluble expression

The target protein 100 kDa was expressed in inclusion bodies before codon optimization, and the supernatant was soluble in 75% after codon optimization.



Citations Database

Tsingke has been cited in numerous journals such as Nature, Cell, Science, and others, totaling thousands of citations.

Below are some publication details from customers who have placed gene synthesis service orders.

Serial Number	Journal	Impact Factor	Title	DOI
1	Nature Biotechnology	68.164	Strand-selective base editing of human mitochondrial DNA using mitoBEs	10.1038/s41587-023-01791-y
2	Science	56.9	Structure of the human PKD1-PKD2 complex	10.1126/science.aat9819
3	Science	56.9	Enhancing rice panicle branching and grain yield through tissue-specific brassinosteroid inhibition	10.1126/science.adk8838
4	Mol Cancer	41.44	A novel polypeptide encoded by the circular RNA ZKSCAN1 suppresses HCC via degradation of mTOR	10.1186/s12943-023-01719-9
5	Circulation	39.9	Cannabinoid Receptor 2-Centric Molecular Feedback Loop Drives Necroptosis in Diabetic Heart Injuries	10.1161/CIRCULATION.AHA.122.059304
6	JOURNAL OF INFECTION	38.637	MAMDC2, a gene highly expressed in microglia in experimental models of Alzheimers Disease, positively regulates the innate antiviral response during neurotropic virus infection	10.1016/j.jinf.2021.12.004
7	Signal Transduction and Targeted Therapy	38.1196	UBQLN1 mediates sorafenib resistance through regulating mitochondrial biogenesis and ROS homeostasis by targeting PGC1β in hepatocellular carcinoma.	10.1038/s41392-021-00594-4
8	Signal Transduction and Targeted Therapy	38.1196	O-GlcNAcylation of YTHDF2 promotes HBV-related hepatocellular carcinoma progression in an N6-methyladenosine-dependent manner	10.1038/s41392-023-01316-8
9	Signal Transduction and Targeted Therapy	38.1196	Excessive branched-chain amino acid accumulation restricts mesenchymal stem cell-based therapy efficacy in myocardial infarction	10.1038/s41587-023-01791-y
10	Signal Transduction and Targeted Therapy	38.1196	Targeting carnitine palmitoyl transferase 1A (CPT1A) induces ferroptosis and synergizes with immunotherapy in lung cancer	10.1126/science.aat9819





Resource Center





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