



# Gene Synthesis and Related Services

GenCefe Biotech's experienced R&D and production team has established an advanced gene synthesis technology platform, standardized operating procedures, and a strict quality control system. We provide high-quality customized services including gene synthesis, codon optimization, PCR cloning, subcloning, plasmid preparation, site-directed mutagenesis, and mutation library construction.

Just submit the gene sequence you need, and GenCefe will deliver the desired plasmid to you on time!



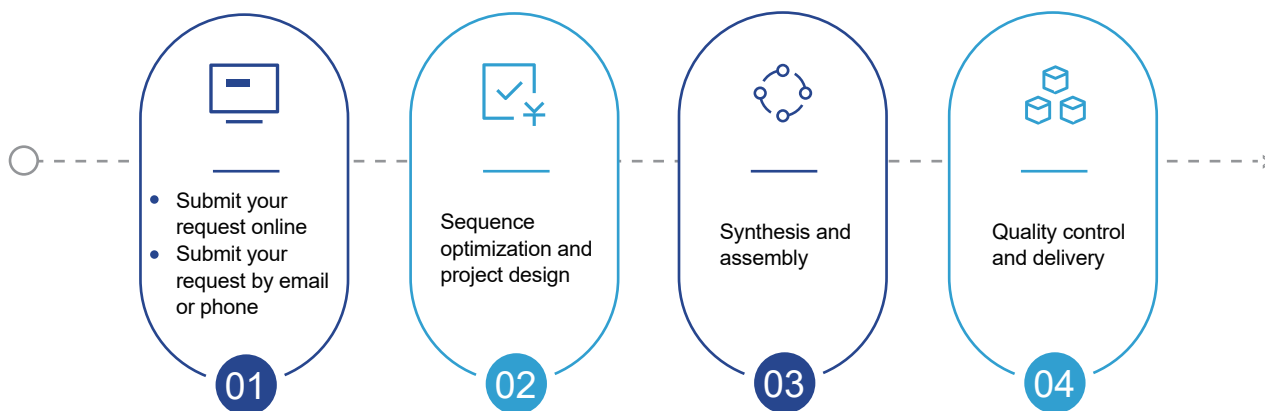
# GenCefe Biotech Gene Synthesis Platform

## Key Features

- **Advanced technology platform:** our team has successfully synthesized various types of difficult sequences, such as repetitive sequences, GC/AT-rich sequences, etc., and delivered the plasmids according to customer-specific requirements
- **Professional technical support:** considerate pre-sales and after-sales services, free codon optimization and project design, timely project updates, and free technical consulting
- **On-time delivery:** experienced production and R&D teams ensure the on-time delivery rate of over 95%
- **Intellectual property protection:** the nucleic acid/amino acid sequence provided by the customer is kept strictly confidential and will not be distributed to third-party in any form



## How to Order



# Gene Synthesis Services

GenCefe provides synthesis services for natural sequences, codon-optimized sequences, gene libraries, complex sequences, long sequences, and other customized gene sequences, which can be cloned into any site of the specified vector, and the successful delivery rate can reach 99.9%. Our professional technical support team will communicate with you and solve technical problems quickly and efficiently.

## Service Process



## Service Specifications

Gene Length	Turnaround Time (Business Day)	Price*
<=526 bp	5-8	\$79/gene
527~1500 bp	6-10	\$0.15/bp
1501~3000 bp	10-15	\$0.15/bp
3001~5000 bp	15-20	\$0.23/bp
5001~7000 bp	20-25	Get a Quote
>7000 bp	Get a Quote	Get a Quote

\* The minimum charge for gene synthesis services is \$79/order.

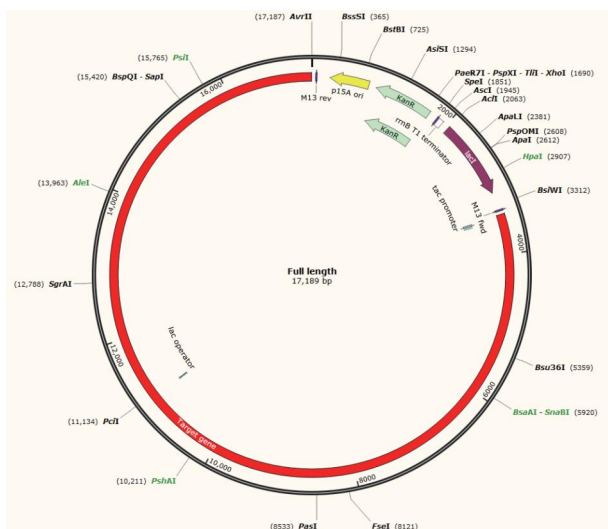
## Delivery Specifications

- 4 µg of lyophilized plasmid
- Construct map of the plasmid (e-version)
- Sequence chromatograms covering your gene (e-version)
- Quality assurance certificate

## Case Studies

### Case Study 1—13.7 kb gene synthesis and plasmid modification

The 13.7 kb gene sequence was synthesized, assembled, and cloned into the designated vector site specified by the customer. The sequence was verified to be 100% correct by sequencing, and high-quality plasmids were successfully delivered by GenCefe.



### Difficulties of the Project

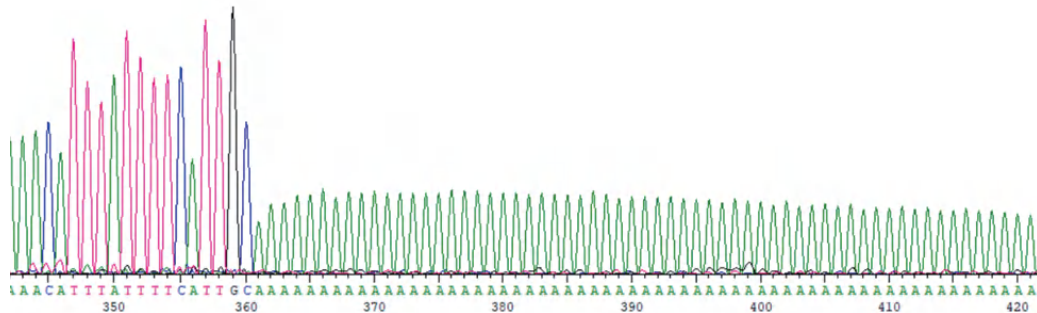
- The sequence length reaches 13.7 kb, and it is prone to deletions during assembly
- The vector was provided by the customer, and there was no suitable restriction site for the insertion of the target gene on the vector
- Low copy vector, difficult to prepare

### GenCefe Solutions

- The proposal was designed by experienced technical experts; using our proprietary assembly technology to ensure the correct full-length sequence
- Carried out vector modification, and successfully cloned the target sequence into the designated position of the modified vector
- Self-developed competent cells and formula medium were used to increase the number of plasmid copies.

## Case Study 2—difficult-to-synthesis gene sequence (PolyA-rich)

The gene sequence containing 110 consecutive PolyA has been successfully synthesized and verified by sequencing. And the 100% sequence correct plasmids were delivered to customers.



### Difficulties of the Project

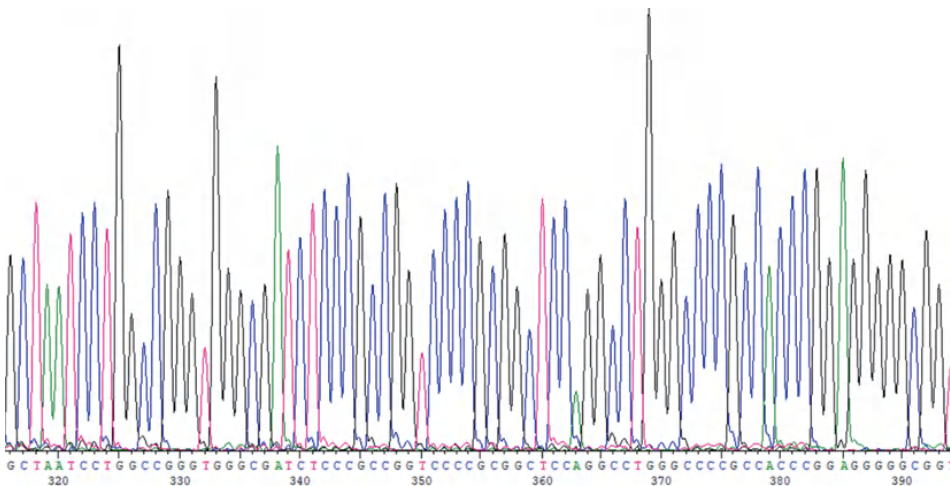
The sequence contains a continuous PolyA structure of up to 110 bases. Such consecutive single-base repeats can lead to plasmid instability and abnormal sequencing signals.

### GenCefe Solutions

- A specific synthetic scheme was designed for this sequence.
- Optimized construction and cloning protocols to reduce mutations.
- Optimized sequencing protocols to ensure accurate validation.

## Case Study 3—difficult-to-synthesis gene sequence (GC-rich)

We have successfully synthesized and verified the gene sequence containing high GC content, direct repeats, and polymer structures. And the 100% sequence correct plasmids were delivered to customers.



### Difficulties of the Project

- The GC-rich region accounts for >35% of the total length, and the sequence GC content fluctuates notably. Such structure often leads to non-specific amplification and causes failure to amplify the target gene.
- Direct repeats plus polymer structures account for >30% of the total sequence. Repetitive sequences cause difficulties in assembly, while polymer structures cause sequencing difficulties.

### GenCefe Solutions

- A specific synthesis scheme was designed for this sequence, and the gene sequence is synthesized in segments.
- Proprietary assembly technology was used to ensure the accuracy of full-length sequences.
- Optimized construction and cloning protocols to reduce mutations.
- Optimized sequencing protocols to ensure accurate validation.

## Plasmid Preparation

GenCefe provides you with high-quality plasmid preparation services, flexible production scale from micrograms, milligrams to grams; strict quality control to ensure batch-to-batch stability. We can perform endotoxin removal according to customer requirements to meet different plasmid production needs of research level and transfection level.

### Service Process



### Key Features

- **Flexible production scale:** microgram to gram level plasmid preparation
- **Strict quality control methods:** multiple QC standards and customized QC items are available upon request
- **Fast turnaround time:** deliver the plasmid DNA in as soon as 3 business days
- **Comprehensive services:** from gene synthesis to custom cloning and plasmid preparation

### Service Specifications

	Research Level	Transfection Level
Endotoxin Level	NA	<0.05EU/μg or <0.005EU/μg
Scale	μg to g level	
Turnaround Time	Starting from 3 business days	
QC Method	Standard QC Items Research-level QC standards	Standard QC Items Transfection-level QC standards
Recommended Applications	Molecular biology research: gene cloning, mutagenesis, DNA library construction, transient protein expression, etc.	Industrial applications: mammalian cell transfection, viral packaging, protein expression, antibody production, GCT, vaccine development, etc.
Deliverables	Plasmid DNA, QC Report	

### Plasmid Preparation QC Standards

	QC Items	Detection Method	Standards	
			Research Level	Transfection Level
Standard Items	Appearance	Visual inspection	Transparent without impurities	Transparent without impurities
	A260/280	Micro-spectrophotometer	1.8-2.0	1.8-2.0
	Concentration		1μg/μL	1μg/μL
	Supercoil ratio analysis	Agarose electrophoresis grayscale analysis	>50%	>90%
	Genomic DNA		< 15% of total plasmid DNA	< 15% of total plasmid DNA
	RNA residue	Agarose electrophoresis analysis	Undetectable	Undetectable
	Restriction Enzyme Validation	Agarose gel electrophoresis analysis of digested products	No stray bands	No stray bands
	Sequencing verification	Sanger sequencing	100% correct	100% correct
	Endotoxin Residue Analysis	Endotoxin Analysis Kit	NA	≤50EU/mg
Custom Items	Bioburden	Plate coating after filtration	No colonies after 48 hours	No colonies after 48 hours
	Others	Customizable according to customer's needs		

## PCR Cloning & Subcloning

GenCefe can help customers clone the target gene into any site of the specified vector to meet different needs. Our professional technical team has experience in cloning more than a hundred commercially available vectors and is also confident in designing customized cloning solutions for customers' vectors.

### Subcloning Service Specifications

Service Type	Gene Length	Turnaround Time (Business Day)	Price
Subcloning bundled with gene synthesis	<3000 bp	5 Business Days	\$29/gene
	3001 bp - 5000 bp	8-10 Business Days	Get a Quote
	>5000 bp	Get a Quote	Get a Quote
Subcloning Only	<3000 bp	6-10 Business Days	\$59/gene
	3001 bp - 5000 bp	10-12 Business Days	Get a Quote
	>5000 bp	Get a Quote	Get a Quote

### PCR Cloning Service Specifications

Gene Length	Turnaround Time (Business Day)	Price
< 1000 bp	5-8 Business Days	\$79/gene
1000 bp - 3000 bp	10-14 Business Days	Get a Quote
3001-5000 bp	10-14 Business Days	Get a Quote
> 5000 bp	Get a Quote	Get a Quote

## Synthetic DNA Libraries

GenCefe's experienced R&D and production team relies on the advanced AI bioinformatics platform and gene synthesis platform to provide customized synthetic DNA library services. We can mutate the amino acid or nucleotide sequences specified by customers, or design and synthesize mutation libraries according to customer requirements.

### Service Specifications

Library Types	Recommended Applications
<b>Site-directed mutagenesis libraries</b>	1) Research on protein structure and function; 2) Study of the enzyme active sites; 3) Study on the antibody binding domains; 4) Protein property modifications, such as changing thermal stability, substrate binding specificity, etc.
<b>Random mutant libraries</b>	1) Research on protein structural functional domains; 2) Antibody humanization; 3) Protein property modifications, such as the determination of the catalytic domain of the enzyme, the improvement of catalytic properties, etc.
<b>Degenerate mutation libraries</b>	1) Research on protein structural functional domains; 2) Directed evolution of proteins, enzymes, antibodies; 3) Determination and modification of key amino acids in enzyme active sites; 4) Antibody humanization, fine-tuning of antibody affinity and binding properties.
<b>Controlled libraries</b>	1) Directed evolution of proteins, enzymes, antibodies; 2) New drug target screening; 3) In-depth study of the effect of a few amino acids around the catalytic site of the enzyme on the catalytic properties of the enzyme, etc.
<b>sgRNA libraries</b>	1) Large-scale gene knockout, activation and suppression; 2) Identification and verification of new drug targets; 3) Identification of cancer treatment targets; 4) Applications in agricultural field, such as development of disease-resistant crops.

## GenCefe Biotech

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