GENE

Gene Synthesis Service Handbook

www.genscript.com
[2022 edition]

Gene Synthesis Service Handbook 2022 edition

GenScript
Make Research Easy

Make People and Nature Healthier Through Biotechnology

ABOUT US

GenScript Biotech Corporation (stock code: HK.1548) is a leading global provider of life science research, development and manufacturing services. Rooted in solid gene synthesis technology, GenScript has established four major platforms: life science service and product platform, biomedical contract development manufacture organization (CDMO) platform, cell therapy platform and industrial synthetic biological products platform.

Founded in 2002, GenScript established its R&D and manufacturing headquarters in Nanjing, China in 2004. In 2015, GenScript was listed on the Main Board of the Stock Exchange of Hong Kong, with legal entities in the United States, China, Hong Kong, Japan, Singapore, the Netherlands and Ireland. It operated business in over 100 countries and regions worldwide, providing quality, convenient and reliable services and products for more than 100,000 customers.

As of December 31, 2021, GenScript owned more than 5,200 employees worldwide, with over 40% of them holding a Ph.D. or master's degree. GenScript has a number of intellectual property rights, including more than 180 granted patents and more than 670 patent applications, as well as a high dense technical secrets.

With its mission of “making people and nature healthier with biotechnology”, GenScript is committed to be one of the most trusted biotechnology companies in the world. As of December 31, 2021, GenScript’s services and products have been cited in over 65,600 peer-reviewed international academic periodical articles.

HISTORY & MILESTONES

2002

- **GenScript established in New Jersey, USA**

2004

- Introduced **custom protein and antibody services**
- Established research and production facilities in **Nanjing, China**

2009

- Received investment from **KPCB China/The Balloch Group**

2011

- Established a new R&D and production base in **Nanjing**
- Participated in the **synthetic yeast genome Sc2.0 project** as the only commercial entity selected
- Established **Japanese** subsidiary
- Number of employees reached **1,000**

2013

- **Established Bestzyme** (Industrial Synthetic Bioproducts Division)

2014

- **Established Legend Biotech** (Cell Therapy Division) Awarded the Commissioned
- **Research Institute** Leadership Award

2015

- **Listed on the Hong Kong Stock Exchange** (stock code: HK.1548)

2017

- Legend Biotech and Janssen Biotech entered into a global strategic partnership for **BCMA products**
- **CFDA** accepted Legend Biotech's IND application
- Acquired 100% shares of CustomArray and **obtained chip gene synthesis technology**

2018

- **BCMA Product received IND approval** in China and U.S.
- **BCMA program** progressed well in China and U.S.
- **Biologics CDMO** business unit officially established

2019

- **New GMP Biologics CDMO R&D** Center was in operation
- LCAR-B38M/JNJ-4528 was granted **orphan drug status by the**
- **FDA and priority drug status** by the EMA
- **LCAR-B38M /JNJ-4528 U.S. Phase 1b /2 clinical data achieved excellent performance of 100%ORR and 69%CR**

2020

- The Company jointly developed the world's **first neutralization antibody detection kit** with Singapore to combat the epidemic of COVID-19
- **Legend Biotech** was publicly listed on NASDAQ

2021

- **GenScript ProBio (Biologics CDMO)** became a leading CDMO in gene therapy and cell therapy in China through A round of financing
- Legend Biotech **Cilta-cel** cell therapy product submitted a biologics license application (BLA) to the FDA and expected to be approved by the end of February 2022
- With more than **5200 employees**, the group distributed life science production capacity in **Singapore and the United States** and cell therapy production capacity in **Belgium** to serve the global market

Content

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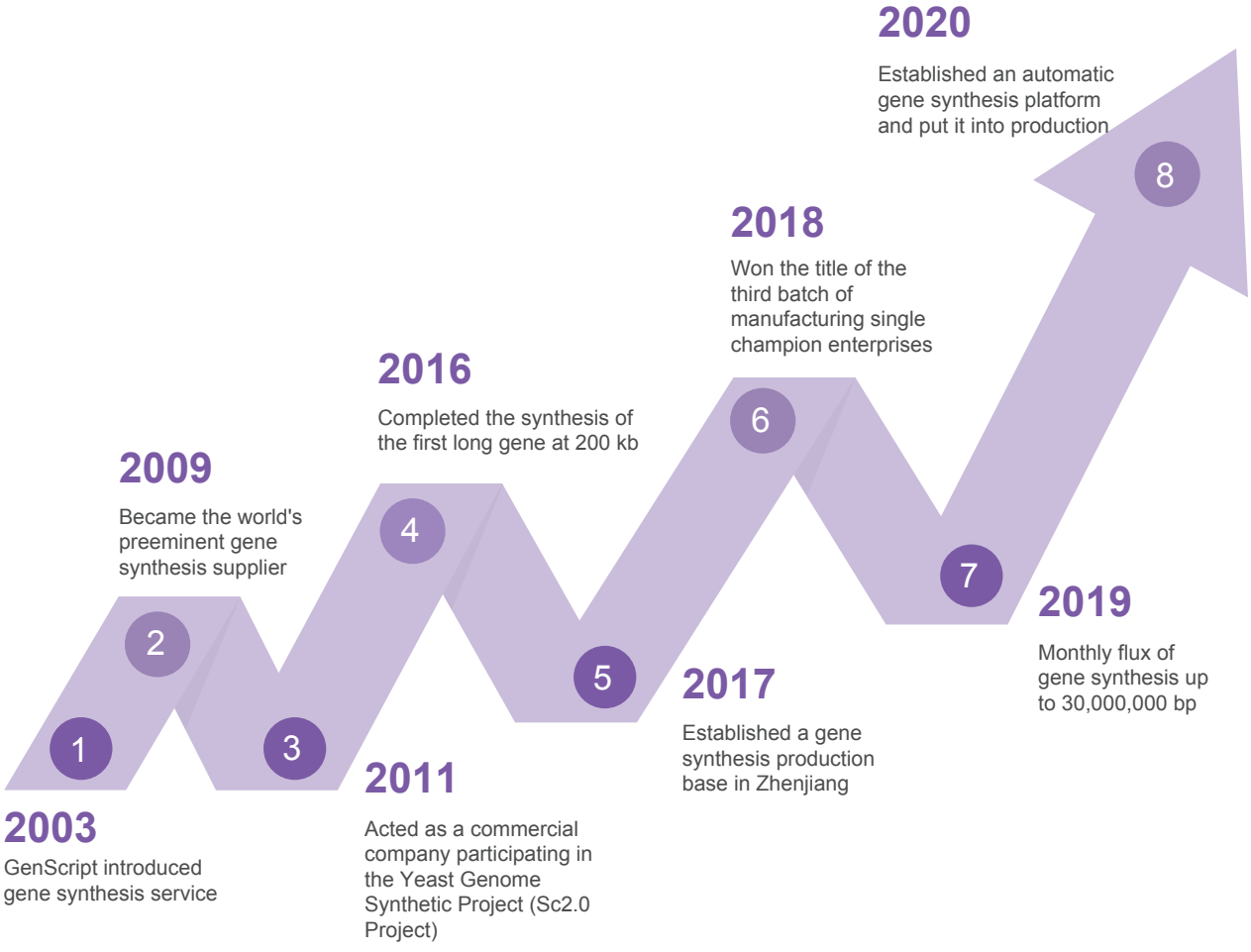
About GenScript Gene Synthesis

GenScript Gene Synthesis History

- As one of the leading gene synthesis companies, GenScript can synthesize more than 30,000 genes per month, with the longest synthetic gene fragment up to 200 kb. GenScript can provide high-quality downstream services such as plasmid construction, gene mutation, plasmid DNA preparation, ORF cloning services, GenBrick™ long fragment gene synthesis and gene mutation library construction, to fully meet your needs for molecular biology experiments.
- In addition, GenScript provides free VectorArk vector storage service and establishes a proprietary molecular biology order file for each customer, helping customers reduce the time, expense and manpower required for molecular biology material management, and reducing the time cost of communication in subsequent orders.
- Through the GenSmart™ platform, GenScript also applies intelligent tools into services to provide customers with more resources in a more convenient way.



Production Environment and Equipment

Strictly abiding by the safety standard production process, GenScript Gene Synthesis has perfect high-precision experimental equipment and a highly efficient production team with professional training to ensure ultra-fast delivery while focusing on delivery quality assurance.

Advanced Technology Platform

Automated Gene Synthesis Platform

GenScript has an automated intelligent gene synthesis platform that intergrate intelligence into the service. With advanced automation equipment, the monthly flux of automated gene synthesis has increased from 10M bp in 2019 to 200 million bp in 2021 since the start of layout and design of automated production lines.

Industrial Advantage

- Correct sequence
- Gene synthesis project > 2 million
- Monthly flux of gene synthesis > 30,000
- Cloned to any vector
- Up to 200 kb sequence length
- Delivery rate of 99.9%
- Free commercial vector > 150
- Complex genes > 300,000

Efficient Plasmid Extraction Platform

GenScript provides preclinical grade plasmid DNA with comprehensive and strict quality specifications, and additional QC analysis can be performed according to your preclinical program requirements. The platform can be applied in preclinical in vivo animal research such as gene mice and non-human primates, and it is an ideal choice for gene therapy, cell therapy and vaccine R&D.

Industrial Advantage

- Low copy plasmids > 120,000
- Plasmid extraction orders > 800,000
- Monthly flux of plasmid extraction of 60g
- Delivery rate of 99.9%

02

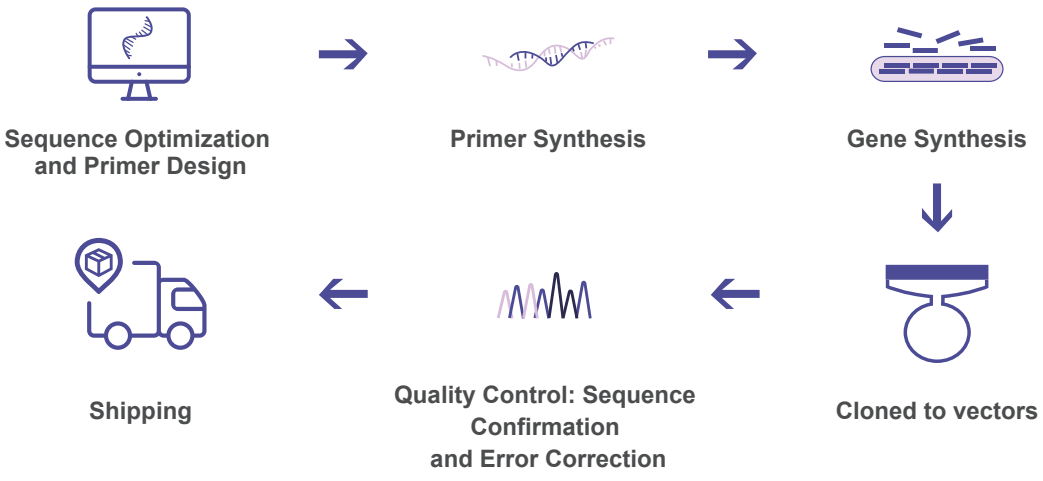
Gene Synthesis Related Service

Gene Synthesis Service

Relying on proprietary gene synthesis technology, GenScript gene synthesis service has established a sophisticated standard production management process with 99.95% success rate and 99% on-time delivery rate of gene synthesis, respectively. Our gene synthesis can undertake high-throughput gene synthesis service with a monthly synthesis flux up to 30,000.

GenScript is technically superior in the field of difficult DNA synthesis, such as rich repetitive sequences, high GC content, hairpin structure, and continuous single base, with the longest synthetic genes reaching 200 kb.

Gene Synthesis Steps



Gene Synthesis Service Type

Service Name	Gene Length	Turnaround time (Starting from)	Service Features	Shipping Methods	QC File
Standard Gene Synthesis	≤8 kb	8 days	Standard service sequence with 100%	• 4 μg of lyophilized plasmid DNA (high-copy) • 1 μg of lyophilized plasmid DNA (low-copy)	• COA File • Sequence Comparison File • Sequencing Map • Plasmid Structure Map
Fast Gene Synthesis	≤5 kb	7 days	Short Delivery Cycle in Fast Channel		
Economy Gene Synthesis	≤8 kb	10 days	Affordable Price		
GenBrick™ Gene Synthesis	>8 kb	23 days	Synthesized gene segment in 200 kb		

*The delivery cycle refers to the business days of the delivery and it is suitable for common sequences transformed in typical *E.coli* cell lines, with the cycle being prolonged in case of difficulty sequences or additional requirements.

Standard Gene Synthesis

Compared with traditional molecular cloning, gene synthesis can efficiently and economically synthesize any template-free sequence. GenScript standard gene synthesis service can ensure the correctness of the sequence.

Service Advantages

≥ 99% on-time delivery rate

Any difficulty and any vector

Accurate sequence

On-line ordering and instant quotes

Service Details

Service number	Gene Length	Turnaround time (BD)	Vector form
SC1010	≤1,500 bp	8-10 days	Any vector
	1,501-3,000 bp	10-12 days	
	3,001-5,000 bp	15-20 days	
	5,001-6,000 bp	20-25 days	
	6,001-8,000 bp	23-30 days	

*The delivery cycle refers to the business days of the delivery and it is suitable for common sequences transformed in typical *E.coli* cell lines, with the cycle being prolonged in case of difficulty sequences or additional requirements.

Delivery standard

- 4 μg of lyophilized plasmid DNA (high-copy) or 1 μg of lyophilized plasmid DNA (low-copy)
- Additional bacterial glycerol containing recombinant plasmid are available (please specify your request before placing your order)
- QC files: COA file, sequence comparison file, sequencing map, plasmid map

Value Added Services

- Free codon optimization: We optimize protein expression yield and quality by independent R&D platform and advanced optimization algorithm;
- Customized subcloning: We can clone the sequence to any vector, and provide 150+ kinds of common commercial vectors free of charge;
- Mass preparation of plasmid DNA: We provide plasmid DNA preparation services from μg-scale to g-scale, from scientific research to industrial level

Fast Gene Synthesis

Based on 19 years of rich experience in gene synthesis, GenScript can provide express gene synthesis services with a gene delivery in as few as 11 working days. Our express gene synthesis service helps you to save synthesis time, speed up the process of experiment, which is your first choice of gene synthesis service!

Service Advantages

Fast delivery in 11 days

Cycle guarantee, worry-free choice

Precise synthesis, accurate sequence

Service Details

Service Number*	Gene Length	Delivery Cycle**	Vector
SC1619	≤249 bp	11 days	Any vector
	250-1,500 bp	13 days	
	1,501-3,000 bp	13 days	
	3,001-5,000 bp	20 days	

*Express gene synthesis services are applicable to genes with length ≤ 5.0 kb, standard and non-difficult genes, and it can not bound to cloning, mutation and plasmid preparation services.

**The delivery cycle refers to the business days of the delivery and it is suitable for common sequences transformed in typical E.coli cell lines, with the cycle being prolonged in case of difficulty sequences or additional requirements.

Delivery standard

- 4 μg of lyophilized plasmid DNA (high-copy) or 1 μg of lyophilized plasmid DNA (low-copy)
- QC files: COA file, sequence comparison file, sequencing map, plasmid map

Economy Gene Synthesis

Economy Gene Synthesis technology platform integrated parallel synthesis and automation platform, which realized high-throughput gene synthesis with monthly flux up to 30,000, and reduced the cost of single gene synthesis. Economy Gene Synthesis service can meet the research needs of researchers on gene library construction, genome engineering, metabolic engineering, etc.

Service Advantages

Synthesized multiple sequences at one time

Lower price in single sequence

Accurate sequence

Wide application

Service Details

Service Number	Gene Length	Turnaround time (BD)	Vector
SC1645	≤249 bp	15 days	Any vector
	250-1,500 bp	10-15 days	
	1,501-3,000 bp	10-15 days	
	3001-5,000 bp	20-29 days	
	5,001-6,000 bp	20-29 days	
	6,001-8,000 bp	35-44 days	

*The delivery cycle refers to the business days of the delivery and it is applicable to common sequences, with the cycle being prolonged in case of difficulty sequences or additional requirements.

Delivery standard

- 4 μg of lyophilized plasmid DNA (high-copy) or 1 μg of lyophilized plasmid DNA (low-copy)
- QC files: COA file, sequence comparison file, sequencing map, plasmid map

Value Added Services

- **Free codon optimization:** Optimize protein expression yield and quality by independent R&D platform and advanced optimization algorithm
- **Full downstream service:** Seamless connection of subcloning, plasmid preparation and protein expression evaluation

GenBrick™ Long Fragment Gene Synthesis

GenBrick™ long fragment gene synthesis service can synthesize long fragment gene up to 200 kb without any mutations or errors, guaranteeing sequence accuracy and the ability to accurately and efficiently assemble multiple DNA fragments. Compared with the traditional method of splicing and assembling several short fragments of DNA multiple times, this technology greatly saves time and cost.

Service Advantages

One-step assembly

Gene fragment up to 200 kb

Precise synthesis
Accurate sequence

Service Details

Service Number	Gene Length	Turnaround time	Vector**
SC1584	8,001-15,000 bp	>23 days	pUC57-brick or pCC1-brick vector
	15,001-30,000bp	>35 days	
	30,001-50,000 bp	>50 days	
	> 50,000 bp	Evaluated according to the sequence	

*The delivery cycle refers to the business days of the delivery and it is applicable to common sequences, with the cycle being prolonged in case of difficulty sequences or additional requirements.
**Providing custom subclones: Cloned the sequence to other vectors.

Delivery Standard

- 4 μg of lyophilized plasmid DNA (high-copy) or 1 μg of lyophilized plasmid DNA (low-copy)
- QC files: COA file, sequencing map, plasmid map

Applications

- Synthetic Genome
- Metabolic/Pathway Engineering
- Industrial Microorganism
- Development of Natural Products
- Environmental Microbiology/Bioremediation

Gene Cloning Service

Independent of the enzyme digestion site of the vector, GenScript cloning technology can directly clone the target gene fragment to the designated site of any vector, which saves a lot of time compared with common cloning methods. Our customers can choose the express cloning service with only 2 business days, and we can also provide you with more than 150 expression vectors free of charge.

Common Expression Vectors

Mammalian System	Yeast Expression System	Baculovirus/Insect Expression System	Bacterial Expression System
pcDNA3.1(+)	pAO815	pBacPAK8	pBluescript II KS(-)
pcDNA3.1(-)	pPIC 3.5k	pBacPAK9	pBluescript II SK(-)
pcDNA3.1(+)_myc-His A	pPIC9	pAcG2T	pET-3a
pCI-Neo	pPICZalphaA	pAcHLT A	pET-11a
pcDNA3.1+C-DYK	pPICZalphaB	pAcSG2	pGEX-2TK
pCMV-3Tag-1a	pPICZalphaC	pBAC-1	pGEX-4T-1
pcDNA3.4	pESC-TRP	pFastBac1	pMAL-c4x
pGenlenti	pESC-URA	pFastBac-Dual	pGEX-4T-1-H(RBS)

For more details of the vector list, please visit: https://www.genscript.com/gene-cloning-subcloning.html

Service Details

According to customer requirements, the target fragment is amplified or digested by enzyme from the template, connected to the target vector, and verified by sequencing.

Service Number	Information Provided by Customers	Delivery cycle*
Express Cloning Service SC1691	• For template information, the original sequence of customers must be provided with sequencing color map. If the sequence cannot be provided, sequencing verification fee shall be added • For target vector information, if the plasmid was constructed by the customer, the sequencing results must be provided • Target DNA fragment sequence and enzyme digestion sites at two ends • Non common restriction enzymes are provided by the customer or ordered with the help of GenScript, and the customer shall pay for the expenses and return the remaining products	Express Cloning Service 2 days
Subclone (Customer Vector) SC1017		Subclone (customer vector) At least 5 days

*The delivery cycle refers to the business days of the delivery and it is applicable to common orders, with the cycle being prolonged in case of difficulty sequences or additional requirements.

Delivery Standard

- 4 μg of lyophilized plasmid DNA (high-copy) or 1 μg of lyophilized plasmid DNA (low-copy)
- QC files: COA file, sequencing map, plasmid map

VectorArk Vector Storage and Cloning

GenScript offers a convenient VectorArk vector storage servicethat allows you to store vectors in GenScript for free. There is no need for you to mail your vectors, and the synthesized genes can be instantly cloned into your designated storage vector for your next plasmid order or to share your vectors with other partners.

Service Number	Service Type	Service Details*
SC1340-5	VectorArk Vector Storage	The vector can be stored in GenScript free of charge for 5 years • Before the customer sends the vector for cloning, GenScript will sequence the MCS region of the vector and analyze the enzyme digestion sites to confirm the integrity of the vector and formulate an appropriate subclonal scheme. • After delivery, the vector and related documents and information will be saved free of charge for 5 years. If you want to store other vectors here, a certain vector QC fee will be charged for vectors that have not been used.
SC1692	VectorArk Clone	Synthesized genes and cloned into your stored vector • 4 μg of lyophilized plasmid DNA (high-copy) • 1 μg of lyophilized plasmid DNA (low-copy) • Sequencing Map • Sequence Comparison File • COA File

*GenScript is committed to protecting our customers' intellectual property rights and maintaining confidentiality of the entire project. GenScript will completely destroy all materials and information upon your request.

ORF Cloning Service

Traditional open reading frame (ORF) cloning needs to start from RNA extraction, cDNA reverse transcription and PCR cloning. These steps not only cost you a certain amount of research funds, but also a lot of valuable time. The ORF cloning service provided by GenScript can synthesize the ORF section of the gene you need in a short time, saving you more time from the tedious experimental steps. We also offer a massive commercial ORF clone database, synchronous NCBI database, which covers 186 different organisms.

Service Advantages

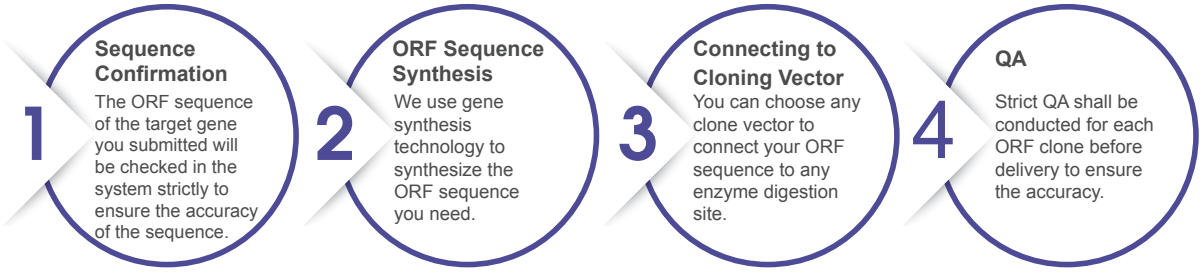
Short cycle and fast delivery

Affordable price

Massive ORF clone database

Clonable to any vector

Service Details



Delivery standard

- 10 μg of lyophilized clone plasmid containing the target gene*
- QC files: COA file, sequencing map, plasmid map

*Bacterial glycerol is not included in this service, but it can be provided if related services (such as mutations, etc.) are required.

03

Plasmid Preparation Related Service

Plasmid DNA Preparation Service

With an automated plasmid preparation platform, GenScript can ensure the stability of plasmid quality among batches and within batches, and realize high throughput plasmid preparation. GenScript offers three different plasmid preparation services: research grade plasmid preparation, industrial grade plasmid preparation and preclinical plasmid preparation. You can choose flexibly based on downstream applications.

Service Advantages

Strict quality control
At least 7 QC items

Flexible options
Provided μg-scale to g-scale plasmid preparation
A variety of additional QC programs are available to meet diverse needs

Ultra low time cost
Fast delivery in 3 days
Lower cost

Service Details

Specs	Research Grade	Industrial Grade	HT Grade	Pre-clinical Grade
Price	From $54	From $138	From $40	From $1678
Volume	100 μg-2 g	100 μg-2 g	10 μg-30 μg	10 mg-2g
Turnaround Time	From 2BD (bundled) From 8BD (stand alone)	From 2BD (bundled) From 8BD (stand alone)	From 2BD (bundled) From 9BD (stand alone)	From 2BD (bundled) From 9BD (stand alone)
Homogeneity	Predominantly supercoiled	≥90±10% supercoiled	≥90±10% supercoiled	≥90% supercoiled
Endotoxin	-	Quantitative LAL assay <0.01 EU/μg	Quantitative LAL assay <0.1 EU/μg	Quantitative LAL assay ≤0.01 EU/μg or ≤0.005 EU/μg
Residual RNA	Non-detectable by gel electrophoresis at 200ng			
Residual E. coli DNA	Non-detectable by gel electrophoresis			Quantitative PCR ≤ 5%
Residual Host Protein	-			HCP ELISA ≤1%
Bioburden Testing	-	No growth on agar plate after 48 hours		
Animal Free Production*	Available with additional charge			
Enzyme Free Production	-			Available with additional charge
Advanced Endotoxin Removal <0.005 EU/μg	-			Available with additional charge
Mycoplasma Contamination	-			Available with additional charge
Kanamycin Detection	-			Available with additional charge
Material Archiving	-			Available with additional charge
Appearance	Clear, colorless, no visible particulates			
A260:280	1.8 - 2.0			Specs
pH	-			8.0 ± 0.5 (in TE buffer) 7.4 ± 0.5 (in PBS buffer) (5-7) ± 0.5 (in ddH2O buffer)
Restriction Analysis	Conforming to reference pattern			

Animal Free Statement

Plasmid Prep QC

*:For research, industrial and HT grade plasmid preps: Since densitometry is semi quantitative, the genomic DNA is considered nonvisible if the comparative intensity of genomic DNA < 15% of plasmid band. Quantitative genomic DNA measurement by qPCR is available with additional charges.

**: Sequence verification of the full gene insert only applies when bundled with gene synthesis (an insert to be cloned into a plasmid).

***: Percentage of supercoiled plasmid may vary when analyzing with different methods or can be altered due to shipping conditions.

Preclinical plasmid extraction - Quality service process ensures high quality delivery

High-density Fermentation

All preclinical plasmids are extracted by high density fermentation to ensure high quality purity

Protein Contamination Removal

Multiple rounds of filtration, centrifugation, sedimentation, ultrafiltration and other processes are performed to fully remove protein contamination

Cross Contamination Removal

Cross contamination is reduced through instrument and production pipeline cleaning processes

RNA Contamination Removal

AKTA purification system is applied to obtain high purity plasmids and reduce RNA contamination

Endotoxin Removal

- The content after endotoxin treatment is ≤ 0.01 EU/μg
- The content after additional endotoxin treatment is < 0.005 EU/μg, and quantitative LAL testing can be provided

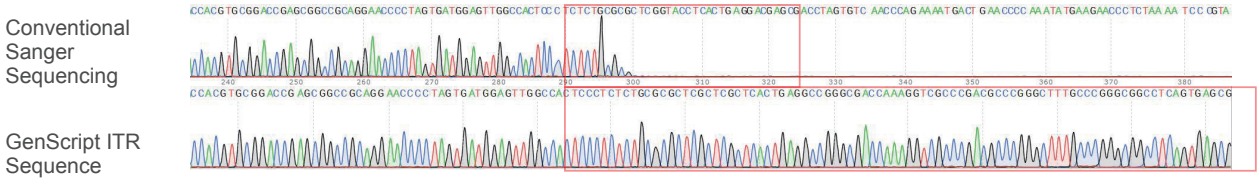
ITR sequencing - Virus vector plasmid extraction special service

ITR sequencing service: An effective method for ensuring the integrity of AAV plasmid
Each AAV plasmid contains two ITR sequences (Inverted Terminal Repeats, 145 nt) located on two wings of the ORF sequence.

Why ITR sequencing is necessary:

- ITR region has instable structure, hairpin structure, palindrome sequence, and high GC
- The plasmid operation process is prone to loss of ITR region fragments
- Loss of ITR sequence may cause virus packaging failure

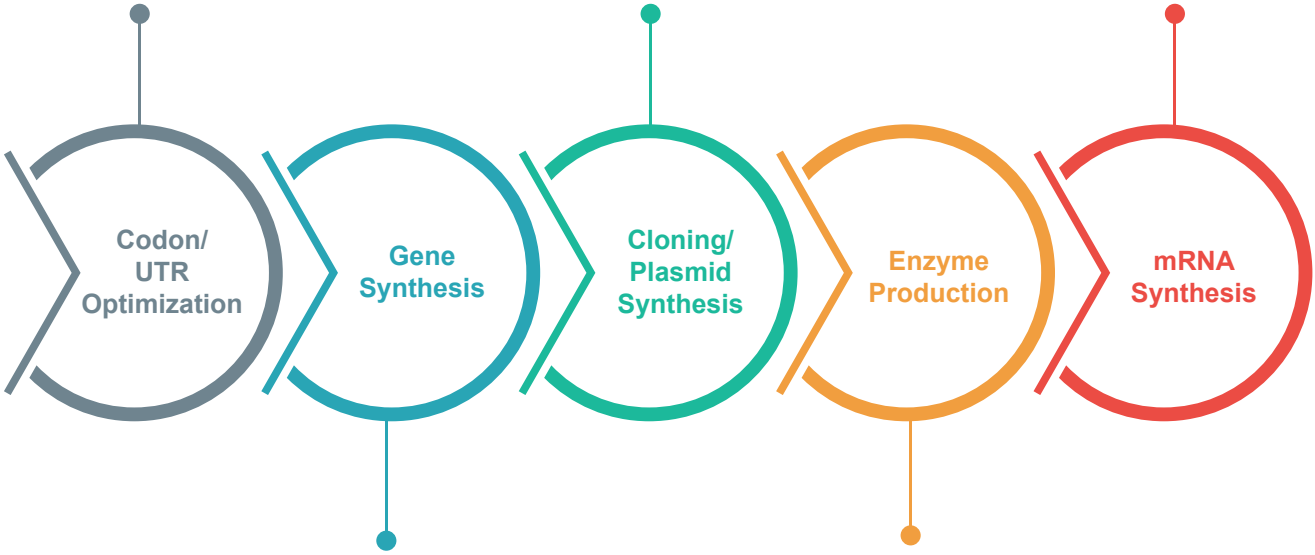
As shown in the figure, conventional Sanger sequencing is difficult to cover the complete ITR sequence



IVT mRNA Solutions

Your key to protein replacement and cancer vaccine development

- Codon optimization for protein expression offered every day for every gene.
- Codon optimization with >200 factors screened (patent)
- Ready to use linearized plasmid DNA for IVT
- Vectors encoded stable Poly(A) tracts with variance of only +/- 5-10 nt
- **Customized RUO to preclinical grade mRNA service**
- **Advanced purification (Oligo dT, dsRNA removal) and variety of QC options**



- 100bp – 200 Kb gene inserts
- TAT as fast as 7 BD to 14 BD
- T7 polymerase, RNase inhibitors, DNase I, Proteinase K, enzymes commercially available
- Mission to develop GenScript mRNA proprietary polymerases and capping enzymes

04

Mutation and Library Construction Service

Gene Mutation Service

Site-directed mutagenesis refers to the introduction of desired changes into target DNA fragments by PCR and other methods, including base addition, deletion and point mutation, and it is a very useful tool in gene research. GenScript can mutate single or multiple bases in template plasmids in a targeted manner according to customer's mutation requirements.

Service Details

Service Number	Information Provided by Customers	Delivery Cycle*
SC1023 (Plasmid template provided by customers) SC1626 (Template previously synthesized at GenScript)	• Plasmids requiring mutation and related vector size, resistance, etc. • The original gene sequence includes color sequencing map and mutation target sequence. If the sequence cannot be provided, the cost of sequencing verification shall be paid • Enzyme Digestion Sites on Both Sides of Genes	• Mutagenesis bundled with gene synthesis, or plasmid mutations in past orders, can be delivered within 12 business days • Plasmids will be delivered within 17 business days from the date of receiving the plasmid

*In case of special cases, the technical support team will contact you in time to ensure early delivery

Delivery Standard

- 4 μg of lyophilized plasmid DNA (high-copy) or 1 μg of lyophilized plasmid DNA (low-copy)
- QC files: COA file, sequencing map, plasmid map

Cautions

- Adjacent multiple base mutations (less than 30 bp) are charged at one site
- Continuous deletion is charged at one point no matter how long it is

Gene Library Construction

Molecular directed evolution refers to a process that simulates the natural evolution process of random mutation, recombination and selection in vitro, which causes a large number of gene mutations and selects the desired mutants from those genes.

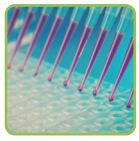
With the rapid development of gene synthesis technology, template genes and a large number of mutants can be rapidly synthesized by gene synthesis technology to form a nucleic acid library. Subsequently, mutants with desired properties or functions can be quickly obtained by combining with high-throughput screening technology. GenScript provides customers with different types of mutant library construction services.

Mutation Library Construction (Protein Engineering)

Truncation Library Construction

Gene Element Combination Library

Precise Mutation Library Service



High-throughput Protein Variants Expression Service

Mutation Library Construction

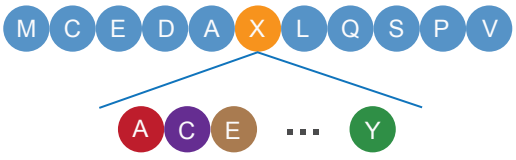
GenScript's powerful gene synthesis technology enables the synthesis of complex protein libraries for customers without increasing the cost.

Service Type	Service Features	Deliverables	Applications
Point Saturation and Mutant Library	Any residue can be replaced by 19 other common amino acids	• 10 μg of mutant product • Mixed-mutagenesis library up to 20 variants for each position (delivered as one small library) • Individual Mutation • Sequence Verification Information • Statistical analysis of base distribution at mutation sites	• Protein function research • Active center research • Special active structure research
Scanning point mutation library	Each site is replaced by all 20 amino acids	• 10 μg of mutant product • Mixed-mutagenesis library up to 20 variants for each position (delivered as one small library) • Individual mutation (optional) • Sequence verification information • Statistical analysis of base distribution at mutation sites	• Improvement of protein function
Random mutation library	The random mutation frequency can be set to any value in the range of 1 to 10 mutations/kb	• 10 μg of linear DNA (with 5' and 3' enzyme digestion site for direct cloning) • Clone library (up to 10^9 transformants): subcloned to a library of custom vectors containing all the bacterial glycerol of transformants	• Protein function research

Precision Mutant Library Service

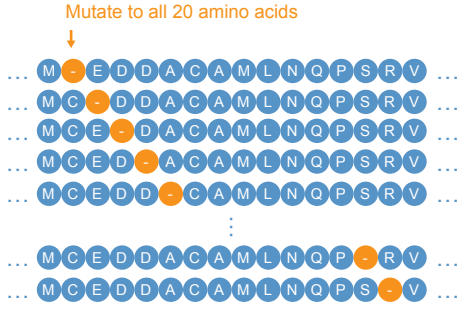
Combined with rich mutation library construction experience and advanced high-throughput semiconductor precision primer pool synthesis technology, GenScript's Precise Mutation Library Service applies a primer pool to synthesize all primers required for the construction of mutation library, which can customize codon optimization according to different downstream expression systems of customers, customize different codon distributions at each mutation site, and fundamentally eliminate the introduction of unexpected or termination codons.

Precise point saturation mutation library SC2009/SC2029



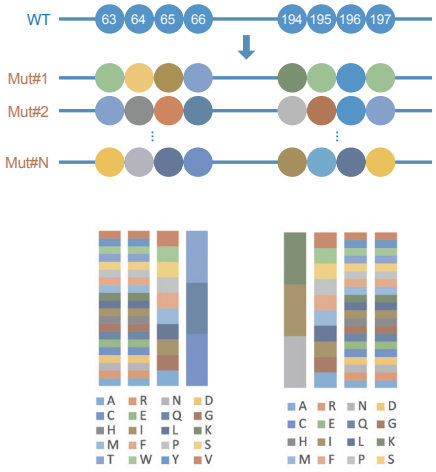
It refers to a library formed by mutating one amino acid site into the corresponding codon of other 19 or all 20 amino acids or any specified codon according to the nucleic acid coding sequence of a protein, and the occurrence frequency of different codons can be customized to form a variety of nucleic acid sequences.

Precise scanning of saturated mutation library SC2011/SC2030



- It refers to a library formed by mutating contiguous amino acid sites within a defined region or of entire protein sequence into 19 other amino acids or all 20 amino acids according to the nucleic acid coding sequence of a protein, and the occurrence frequency of different codons can be customized to form a variety of nucleic acid sequences.
- Only one amino acid site is mutated at a time, and only one amino acid site is mutated in each sequence compared to the template. Delivery can optionally be in sublibraries, each containing the nucleic acid sequence corresponding to an amino acid site mutation, or the delivery of a mixture of all mutants is available.

Precise combination mutation library SC2012/SC2031



- It refers to a library formed by simultaneously mutating several consecutive amino acid sites in one or more regions into any specified amino acid combination according to the nucleic acid coding sequence of a protein, and the occurrence frequency of different codons can be customized to form a variety of nucleic acid sequences.
- Multiple amino acid sites are mutated at a time, and there are more than one amino acid site mutation in each sequence compared to the template. Delivery can optionally be in sublibraries, and simultaneous mutations of several amino acid sites in a region can form a sublibrary of corresponding nucleic acid sequences.

Service Advantages

- Customize codon distribution for eliminating termination codons
- Guaranteed coverage of 90%
- NGS sequencing

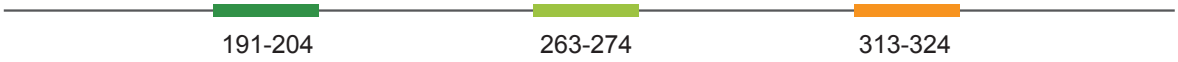
Applications

- Improving antibody binding affinity through CDR engineering
- Identifying critical residues within a protein domain
- Optimizing protein structure
- Optimizing the affinity and stability of enzymes
- Improving the ligand-receptor binding

Display of Mutant Library Cases

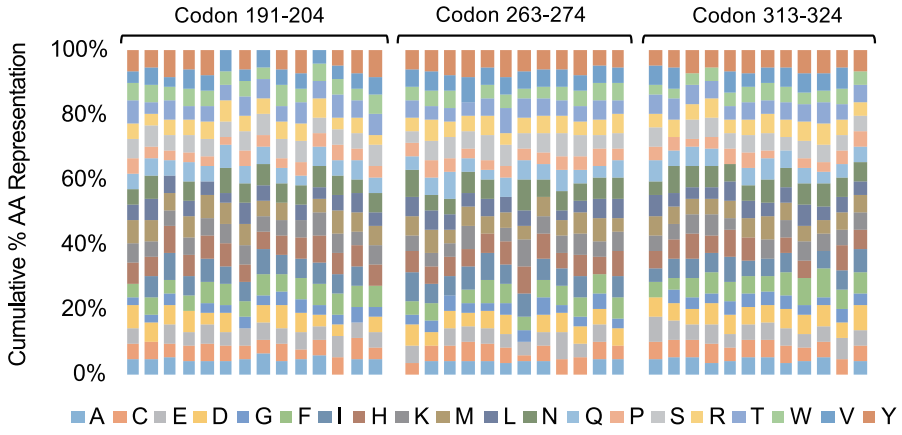
Customer Needs

Scanning saturation mutations are performed at 38 amino acid sites in a protein sequence of 484 amino acids



Item results

- Deliver mutant library of (14 + 12 + 12) × 20 = 760
- Library coverage of 100%
- Uniform distribution of 20 amino acids at each mutation site



Trimer primer and Trimer combination mutation library

Trimer

Trimer refers to the Trimer Phosphoramidites formed by connecting three nucleosides in a fixed order. Each trimer corresponds to a single amino acid.

Trimer primer

Trimer primer refers to the primer synthesized with trimer mixtures as elements.

Trimer Combination Mutation Library

By designing the nucleic acid coding sequence of the target protein, the library simultaneously mutates multiple amino acid sites in the target region into multiple amino acids, so as to produce different mutation combinations to correspond to different mutation types of nucleic acid sequences. At present, it is widely used in protein engineering, antibody screening, drug discovery, enzyme engineering and other research fields.

Comparison of Mutant Library Construction Methods

Library Type	Codon Adaptation Species	Saturated Available Codons	Amino Acid Number	Number of Termination Codon	Avoiding Unexpected Codons	Coverage and Uniformity	Price
NNN library	All	64	20	3	×	Poor	Low
NNK library	All	32	20	1	×	Comparatively Poor	Low
Trimer library	*E.coli*, Yeast	20	Customizable	0	✓	High	Comparatively Low
Precision Mutant Library	All	Customizable	Customizable	Customizable	✓	High	Moderate

Service Advantages

- Higher sequence accuracy
- Fully realizing the customization of amino acid composition and amino acid distribution proportion
- Closing to the theoretical diversity to the greatest extent, with a commitment to 90% coverage of the library
- Effectively avoiding unexpected codons and improving screening efficiency
- Library capacity greater than 10^{10}
- Directly cloned to the customer vector

Delivery standard

- Plasmid or bacterial glycerol
- Fast delivery in 2-3 weeks
- GenScript has a one-stop library quality inspection platform for Sanger sequencing and NGS verification according to customer needs

Applications

- Directed evolution of proteins
- Antibody affinity maturation
- Drug target screening
- Improvement and optimization of enzyme

High-Throughput DNA Library Assembly

High-Throughput DNA Library Assembly can construct multiple predetermined DNA structures (plasmids) from a certain number of gene elements (DNA sequences) according to different permutations and combination schemes. The library adopts seamless assembly technology to ensure that no redundant sequences are introduced into the assembled DNA structure.

With the gene element combination library, you can combine different regulatory elements (promoter, inhibitor, ribosomal binding site, terminator) and coding sequences (open reading frame, functional domain), detect gene expression (GFP, luciferase) or labels for purified proteins (HIS, FLAG, GST), and combine different genetic elements (enzymes, sensors, feedback devices, such as transcriptional, allosteric or degenerative regulatory elements) in metabolic engineering/genetic engineering. GenScript has mature gene synthesis and DNA assembly technology, which can customize cost-effective gene component library construction services according to your needs.

Service Advantages

Highly customized
Developing customized strategies according to specific project requirements

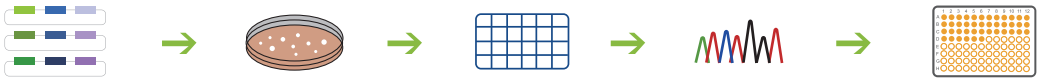
Professional technical support
Technical support for proprietary PhD-level gene element combination library

One-stop service
Bundled with gene synthesis, plasmid extraction and other upstream and downstream services with low price and fast cycle

Service Details

Arrayed Library	
Library Delivery Description	Delivering up to 10,000 individual, precisely designed and assembled plasmids
Screening Conditions	Screening tests on each precisely designed DNA structure
Screening throughput	Screening all designed DNA structures
Shipping Method	1.5 ml EP tube or 96-well plate
QC plan	Sequence verification of all assembled DNA structures

Library Construction Workflow



Each plasmid is individually assembled according to customer requirements

Transformation of *E.coil*

High throughput monoclonal PCR verification

High throughput sequencing verification

Delivery as a full sequence-verified library

Applications

Gene element combination library can be applied in many research fields, including optimization of metabolic pathways, gene circuit design, and directional evolutionary optimization of proteins.

Synthetic Biology

- Metabolic Pathway and Microbial Strain Engineering
- Genome Engineering

Protein Engineering

- Create multi-domain protein libraries for structural or functional screening
- Optimize protein function through directed evolution
- Construct recombinant protein libraries or chimeric antibody libraries

Gene Expression Regulation

- Determine the optimal combination of plasmids or other regulatory elements in the expression system
- Create a library of reporter-gene for systematic promoter analysis

05

GenSmart™ Intelligent Platform

GenSmart™Design

Free Online Vector Design Tool -- GenSmart™ Design

Plasmids have become indispensable research materials in the field of life science and biomedicine, and are widely used in gene function analysis, protein expression, antibody expression preparation and biomedicine. Based on its extensive experience in gene synthesis, GenScript has launched an online vector design tool - GenSmart™Design. The tool breaks the concept of traditional vector design tools based on sequential operation, and takes an "element" as the smallest unit of vector design, realizing the convenience of operation, that is, the vector design can be completed by simple drag and click.

GenSmart™ Design consists of two modules, single plasmid design and plasmid library design, to meet different design requirements. The single plasmid design module is used for fine plasmid design, and equipped with simple operation interface and automatic error correction, codon optimization, automatic identification of functional components and other functions. The plasmid library design module is compatible with NGS, high-throughput screening and other technologies for batch plasmid assembly, making plasmid library design more visual and vivid.

Features

- Online tool that do not require installation
- Automatical identification and annotation of common DNA elements
- Free plasmid mapping export
- Design solutions can be saved online and accessed at any time
- Includes 2,000+ common functional components such as promoters, terminators, and expression tags.
- Includes intelligent error correction function to automatically detect design flaws such as missing termination codons and code shift mutations
- Integrates GenSmartTM on-line ordering system to save time and cost

Please visit: https://www.genscript.com/gene-and-plasmid-construct-design.html

or scan the QR code to review the instructions

GenSmart™ Codon optimization

GenSmart™ Codon Optimization is an online codon optimization tool developed by GenScript and tested in multiple countries and regions for optimizing gene expression in both eukaryotes and prokaryotes.

GenScript has developed the Population Immune Algorithm (Patent Application No.: WO2020024917A1), which integrates the theories of population genetics and immunology and considers the effects of multiple factors on gene expression. It organically combines the two biological theories to guide the regulation of protein expression and thus optimize the expression yield and quality. The algorithm screened and verified more than 200 factors affecting gene expression. Compared with other studies, GenScript takes into account the balance of many factors. With GenSmart™ Codon Optimization, each gene will be customized and optimized to obtain more functional proteins.

Service Advantages

Convenient
A free on-line tool that can be optimized with one-click

Comprehensive Factor Analysis
Screened and validated more than 200 factors

Optimized Algorithm
Population Immune Algorithm

Sequence Customization
Set a weight of each key factor according to the characteristics of proteins

Optimized Parameter

The Population Immune Algorithm is designed to optimize the transcription, translation and protein folding parameters.

Transcription Efficiency

- GC Content
- Cryptic Splice Site
- CpG Dinucleotide Content
- Negative CpG Island
- SD Sequence
- TATA Box
- Termination Signal

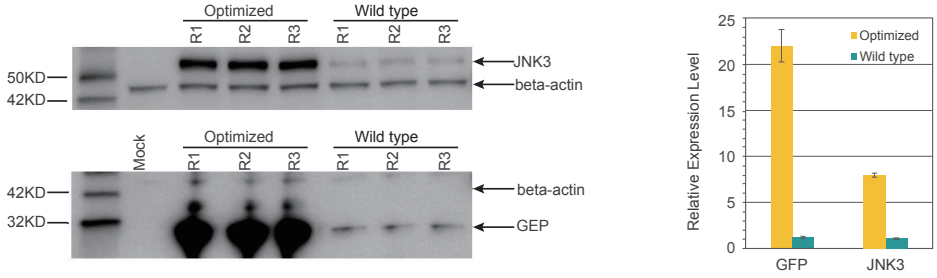
Translation Efficiency

- Codon Usage Bias
- GC Content
- mRNA Secondary Structure
- PolyA Early Signal
- Inhibitory Site
- RNA Unstable Motif
- mRNA Free Energy Stability
- Potential Chi Sequences and Ribosomal Binding Sites

Protein Folding

- Codon Usage Bias
- RNA Secondary Structure
- Codon Context
- Interaction between Codons and Anticodons

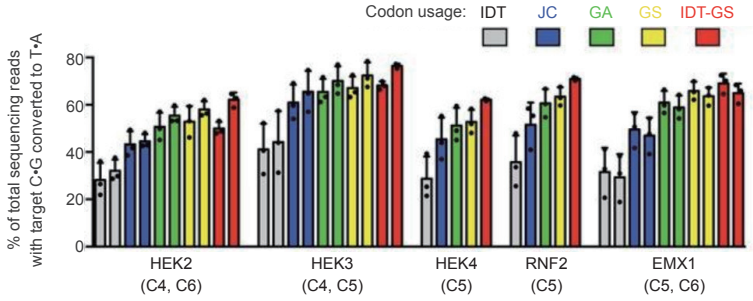
Case 1



Evaluation of the improvement of JNK3 and GFP protein expression by codon optimization tools

The wild-type and optimized sequences were cloned into an expression vector, respectively, and the protein expression in CHO 3E7 was detected by Western Blot (the expression data were obtained from three separate clones). The results showed that the GFP and JNK after codon optimization were significantly improved by 18 times and about 8 times compared with the wild type, respectively.

Case 2



Evaluation of the effect of base editing protein BE4 optimized by different codon optimization tools on gene editing efficiency

Codon optimization tools from various companies, including GenScript (GS), GeneArt (GA), Coller (JC) and IDT, were applied in this case to evaluate gene expression and gene editing efficiency in HEK293. The results showed that the gene expression of GenScript, GeneArt and Coller was better than that of IDT; in terms of the gene editing, GenScript's tools outperformed the other tools.

References: David R Liu's laboratory at Harvard University; Koblan WL et al. 2018. Improving cytidine and adenine base editors by expression optimization and ancestral reconstruction. Nature Biotechnology

For more informations, please visit: https://www.genscript.com/gensmart-free-gene-codon-optimization.html
or scan the QR code

GenSmart™ Instant Quote

Powered by the Population Immune Algorithm, GenScript has established a convenient intelligent on-line ordering system that allows you to instantly know the gene cycle and quotation, and benefit from intelligent money saving mode, intelligent error reporting and other functions.

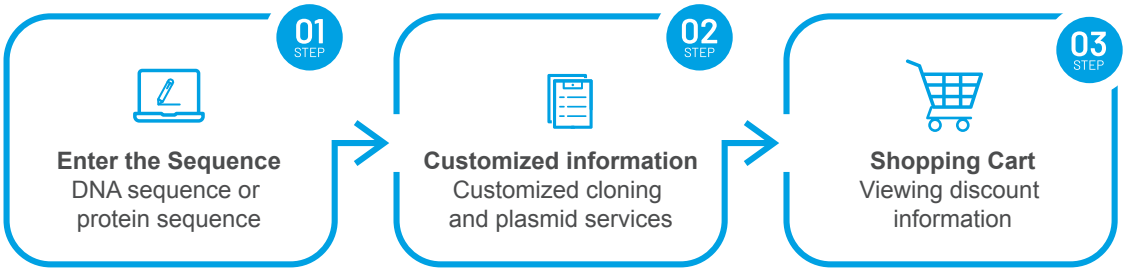
Features

Smart Algorithm
Analyzes your target sequence against GenScript's ORF clone collection to find the optimal synthesis route to save time and cost.

Smart Error Checking
Detects and reports common errors in your design. Enjoy the peace of mind knowing your sequence is in good hands!

Ultimate Convenience
Eases quote and ordering process with our integrated database management system, to price your genes in 1 min.

Ordering Process



Please visit: https://www.genscript.com/gene-synthesis-gensmart-ai-ordering.html

or scan the QR code to review the instructions

06

Gene Synthesis Resource Center

Bioinformatics Tools

GenSmart™ Intelligent Platform

GenSmart™ Design

Platform that requires no installation, automatically identifies and annotates common DNA elements, and intelligently corrects errors

For more information, please visit
https://www.genscript.com/gene-and-plasmid-construct-design.html
or scan the QR code on the left

GenSmart™ Codon Optimization

A free on-line tool with Population Immune Algorithm

For more information, please visit
https://www.genscript.com/gensmart-free-gene-codon-optimization.html
or scan the QR code on the left

CRISPR related on-line tools

CRISPR guide RNA design tool

For more information, please visit
https://www.genscript.com/tools/gRNA-library-design
or scan the QR code on the left

Whole-genome gRNA data

For more information, please visit
https://www.genscript.com/gRNA-database.html
or scan the QR code on the left

Gene Mutation Related On-line Tool

Gene Mutation Design Tool

For more information, please visit
https://www.genscript.com/gene-mutagenesis-designer.html
or scan the QR code on the left

Codon Related On-line Tools

Uncommon Codon Analysis Tool

For more information, please visit
https://www.genscript.com/tools/rare-codon-analysis
or scan the QR code on the left

Codon Use Frequency Tool

For more information, please visit
https://www.genscript.com/tools/codon-frequency-table
or scan the QR code on the left

Codon List

For more information, please visit
https://www.genscript.com/tools/codon-table
or scan the QR code on the left

Restriction Endonuclease On-Line Tool

Restriction Enzyme Map Analysis

For more information, please visit
https://www.genscript.com/tools/restriction-enzyme-map-analysis
or scan the QR code on the left

Common Restriction Sites

For more information, please visit
https://www.genscript.com/enzyme.html
or scan the QR code on the left

PCR Related On-line Tools

Real-time PCR (TaqMan) Primer Design

For more information, please visit
https://www.genscript.com/tools/real-time-pcr-taqman-primer-design-tool
or scan the QR code on the left

Oligo Computing Tool

For more information, please visit
https://www.genscript.com/tools/oligo-primer-calculation
or scan the QR code on the left

PCR Primer Design Tool

For more information, please visit
https://www.genscript.com/tools/pcr-primers-designer
or scan the QR code on the left

Sequencing Primer Design Tool

For more information, please visit
https://www.genscript.com/tools/dna-sequencing-primer-design
or scan the QR code on the left

FAQ

Q1: What are the advantages of gene synthesis compared with traditional PCR cloning?

A1: Gene synthesis has the following advantages:
1. It is low cost-effective because it is time-consuming and expensive to construct tissue-specific cDNA library by common PCR cloning method;
2. The genes obtained by gene synthesis are mutation free and accurate, while the common PCR is likely to cause unexpected results, thus affecting the follow-up experiments;
3. It does not need to rely on templates and enzyme digestion sites.

Q2: What are the advantages of GenScript's gene synthesis service?

A2: Major competitive advantages of GenScript's gene synthesis service are as follows:
1. Gene synthesis platform: It can synthesize any gene, including complex genes rich in special structures such as those containing repeated sequence (unlimited number of repeats), high GC content, hairpin structure, and continuous single base repetition;
2. Codon optimization technology: It improves protein expression and solubility, and promote correct protein folding;
3. CloneEZ “Seamless” Cloning Technology: A new generation of CloneEZ “seamless” cloning technology based on the cloning system can accurately and effectively clone genes into any vector within 30 minutes;
4. Cost Effective: It can provide customers with competitive prices and help customers reduce budgets;
5. Customer information security guarantee: GenScript has a short-cycle gene synthesis and its security system guarantees the security of customers. The company provides services strictly in accordance with the gene synthesis service agreement and confidentiality contract signed with customers;
6. Good customer trust: It can provide reliable service quality, and give DNA sequencing results to ensure the accuracy of the synthetic gene sequence. The genes that GenScript synthesized were cited in the published high-level articles.

Q3: How long genes can GenScript synthesize?

A3: GenScript can synthesize gene sequences of 10 kb or longer. GenScript has successfully delivered thousands of complex genes, including genes up to 200 kb; genes with > 70% high GC content or < 30% low GC content; repeated fragment genes; genes of a strong dimer structure; and genes containing more than 100 consecutive adenines.

Q4: Is codon optimization necessary?

A4: In most cases it is necessary for genes to be used for protein expression, such as genes in eukaryotes that need to be expressed in prokaryotes. As the codon preference of eukaryotes is very different from that of prokaryotes, codon optimization of genes will significantly improve expression efficiency.

Q5: What information do I need to provide for gene sequence optimization?

A5: If there is a need for gene sequence optimization, we need you to provide the following information:
a. Optimized gene or protein sequences;
b. Optimized host;
c. Restriction sites to be added at both ends of the gene or removed in the gene;
d. Do you need specific termination codons?
e. Do you need to add Kozak sequences? For mammalian systems, we generally recommend that you add Kozak sequences.

Q6: If I want to express the target protein in two different hosts, will GenScript be able to optimize it in two hosts?

A6: Yes. Our optimization tool can help you optimize genes for two different host species simultaneously. The tool can simultaneously load optimization parameters such as codon usage bias and homeopathic elements of both hosts. The two-host optimization algorithm searches for the equilibrium point of expression between the two hosts to obtain satisfactory protein expression in both hosts. However, in the case of distant genetic relationship between the two host species, two-host gene optimization is likely to fail in both hosts.

Q7: Which termination codon is preferred in the expression system of E. coli? What about in mammalian systems?

A7: In E. coli, TAG is rarely used; TAA is often used; TGA can be used. In mammals, TGA is used more frequently than TAA and TAG. Compared to the difference between mammals and E. coli, there is not much difference among different organisms in mammals in the Codon Use Table.

Q8: What is the difference between pUC57-simple and pUC57? Under what circumstances does GenScript recommend using pUC57-simple vector?

A8: pUC57-simple vector only retained Ndei and EcoRV, but removed MCS region on the basis of pUC57 vector; GenScript provides the pUC57 standard vector free of charge. Typically, synthetic genes will be cloned into the Sma Ⅰ or EcoRV sites of standard vectors. If the customer requested that some of the commonly used sites on the vector need to be avoided to meet subsequent subcloning requirements, we recommend the customer to use pUC57-simple vector.

Q9: Can GenScript clone the synthetic gene into the vector I specified?

A9: Yes. Except for several pUC57 series vectors, other vectors need to be provided by customers. If you are required to clone the synthetic gene into the vector you specified, you need to provide the relevant vector information, and we will charge the corresponding sub-cloning fee according to the length of the target gene.

Q10: What files are included in the data report provided by GenScript Gene Synthesis Service, and what software should be used to open the files?

A10: The gene synthesis service data report you received is a compressed file in RAR format, which can be opened with Winrar (version 4.0 and above). The data report contains four types of files, which are:

Seq file -- The target sequence file is generated according to the order sequence you provided, and it can be opened with DNASTAR, DNAMAN, and SnapGene software;

abi or ab1 file - The sequencing color map can be opened with Chromas software;

SQD file - The Alignment file is obtained by comparing the target sequence (Seq) with the sequencing result (abi or ab1), and it can be opened with DNASTAR;

PDF file - There are generally two such files, one is plasmid map (describing the general structure of the final plasmid) and the other is QC file.

Q11: How to use GenScript gene to synthesize delivered plasmids and puncture bacteria?

A11: The plasmids provided are lyophilized in vacuum, and the dried plasmids are attached to the bottom of the centrifuge tube in the form of film or powder. The plasmids need to be centrifuged before use in case of missing; the method of plasmid extraction and the quantity of plasmid have been indicated on the label. For normal orders, the small extraction of plasmids is usually applied for extraction, and the plasmids are quantified at 260 nm by uv spectrophotometer. The delivered plasmids OD260/OD280 are guaranteed to be between 1.80 and 2.0, which meets the requirements of conventional molecular biology experiments, such as PCR amplification, enzyme digestion, transformation, and sequencing;

For 4 μg of lyophilized plasmid DNA (1 μg of low-copy lyophilized plasmid DNA), it is recommended to dissolve the plasmids with 40 μL sterilized double distilled water or 10 mM pH8.0 TE buffer, and the plasmid concentration after dissolution is 100 ng/μL. The plasmids can also be dissolved according to experimental needs; the dissolved plasmid should be stored at -20 ℃, and repeated freezing and thawing should be avoided.

Application of puncture bacteria:

We also provide a tube of puncture bacteria for reserve, and the name of the host bacteria has been indicated on the label.

The puncture bacteria should be stored at 4 ℃ with the storing period of one month;

The culture can be scaled-up according to the resistance of the plasmid, and a small piece is selected from the mycelium site with a toothpick, inoculation needle or a tip to scale-up the culture.

Q12: What are the recommended sites for digestion validation of received plasmid products?

A12: A: After receiving the plasmid, the enzyme digestion sites can be selected at both ends or in the middle of the sequence, and can be single or double. The recommended enzyme is expected to be cut in two bands, and only one band or too many bands are not conducive to the judgment of digestion results. In addition, the size difference between the two bands should be greater than 0.5 kb and less than 3 kb. The bands with similar size are not easily separated by electrophoresis; however, if there is a big difference in band size, the small bands will be relatively invisible on the electrophoretogram.

If you have special requirements for enzymatic digestion verification in product reports, you can explain them before ordering, so that we can evaluate the feasibility and make you feel safer.

Q13: Does GenScript provide protein expression service for codon optimized genes?

A13: GenScript also provides protein expression and purification services for synthetic genes. GenScript provides four protein expression systems: prokaryotic protein expression system, yeast protein expression system, baculovirus-insect cell protein expression system and mammalian cell protein expression system.

Q14: Why are there redundant bases at both ends of the restriction site? Do these extra bases affect the use?

A14: The redundant protective bases at both ends is to more effectively ensure the next enzymatic cloning, and it will not affect your experiment; if you have special requirements, you can tell us when ordering, and we will provide you with a satisfactory experimental solution.

Q15: If you have any questions about the delivery results (physical delivery, data report), how should I give feedback to GenScript?

A15 : If you have any questions about our delivery results (physical delivery, data report), you can send an email including your gene order number, plasmid digestion map, sequencing results and specific questions to our Gene Technology Support: Gene@genscript.com.cn. We will reply to you as soon as we receive your email.

Literature Published by Customers

In terms of services and products, GenScript have been cited nearly 10,000 times by more than 1300 journals of biomedicine such as Cell, Nature, Science and PNAS. GenScript's gene synthesis services have been used by 400 world-renowned institutions to publish their scientific achievements, demonstrating once again GenScript's ability to help scientists “Make Research Easy” in the industry. The following is excerpted information of high-score papers from January, 2021 to December, 2021:

Title: Astrocytes phagocytose adult hippocampal synapses for circuit homeostasis
Journal: Nature
IF: 43.07
Doi: 10.1038/s41586-020-03060-3
Product and Service Lines: Gene Synthesis

Title: Neuronal diversity and convergence in a visual system developmental atlas
Journal: Nature
IF: 43.07
Doi: 10.1038/s41586-020-2879-3
Product and Service Lines: Gene Synthesis

Title: Quadrivalent influenza nanoparticle vaccines induce broad protection
Journal: Nature
IF: 43.07
Doi: 10.1038/s41586-021-03365-x
Product and Service Lines: Gene Synthesis

Title: Structural insights into Ubr1-mediated N-degron polyubiquitination
Journal: Nature
IF: 43.07
Doi: 10.1038/s41586-021-04097-8
Product and Service Lines: Gene Synthesis

Title: Structure of Venezuelan equine encephalitis virus with its receptor LDLRAD3
Journal: Nature
IF: 43.07
Doi: 10.1038/s41586-021-03909-1
Product and Service Lines: Mutant Libraries

Title: The EDS1-PAD4-ADR1 node mediates Arabidopsis pattern-triggered immunity
Journal: Nature
IF: 43.07
Doi: 10.1038/s41586-021-03829-0
Product and Service Lines: ORF cDNA Clones/MolecularCloud

Title: Compact RNA editors with small Cas13 proteins
Journal: Nat Biotechnol
IF: 41.667
Doi: 10.1038/s41587-021-01030-2
Product and Service Lines: Codon Optimization

Title: Synthetic virology: the experts speak
Journal: Nat Biotechnol
IF: 41.667
Doi: 10.1038/s41587-021-01078-0
Product and Service Lines: Gene Synthesis

Title: NIN-like protein transcription factors regulate leghemoglobin genes in legume nodules
Journal: Science
IF: 41.037
Doi: 10.1126/science.abg5945
Product and Service Lines: Gene Synthesis

Title: Ultrapotent antibodies against diverse and highly transmissible SARS-CoV-2 variants
Journal: Science
IF: 41.037
Doi: 10.1126/science.abh1766
Product and Service Lines: Codon Optimization

Customer Feedback

"GenScript has been our go-to provider for the lab's gene synthesis needs. The constructs are always on-time (or early), always high quality, and the customer service excellent. I especially appreciate the fast turnaround time on quotes and pricing inquiries."

-- Samuel H. Sternberg, Ph.D., Columbia University

"We love using Genscript for our cloning needs -- they're reliable, handle complex templates, and turn our orders around quickly. But the real reason we use Genscript is the customer support. It took me a week and a lot of work to get a quote from another vendor, whereas Genscript always turns it around next day."

--Sam Rodriques, Ph.D., Boyden lab at MIT

"GenScript provides excellent services in a variety of research needs. I have been using GenScript services for over 10 years now, and the products and services provided have been to my highest satisfaction, and that at blazing speed and reasonable costs. I mostly used GenScript's molecular biology services, but also protein analysis and expression services. Our regional customer support specialist "Aria Zhang" has provided exceptional help and superb assistance. Thank you GenScript for making our research faster and smoother."

— Dr. Sebastian P. Fuchs, University of Miami – Miller School of Medicine

"I think GenScript provides absolutely excellent products in a timely fashion. I have primarily used GenScript to order codon optimized artificial genes. Ordering artificial genes on their website or via Email makes this especially facile because I can simply inquire about a gene, get a quote and then get a PO number. The whole process is fast and the turnaround time for obtaining the finished product is usually less than a month. I also think their technical support are wonderful people, they have been most helpful in facilitating the process. I am so impressed with them that I have recommended them to several of my colleagues."

— Dr. Maria Schumacher, The University of Texas MD Anderson Cancer Center, USA

07

Ordering Guide and Contact Information

Order Method

On-line ordering and real-time quotation make gene ordering simple!

Gene Synthesis Service on GenScript Website → Enter GenSmart ™ on-line ordering → Enter order information: sequence, vector, clone, etc → Submit the Shopping Cart and close an account to complete order

On-line Ordering: Order on-line through GenSmart™, enter DNA sequence or protein sequence to select the service type and other information, submit the shopping cart, and close an account to complete order

Ordering by Customer service: Submit the inquiry form containing gene sequence and other information (can be downloaded at the bottom of the Gene Synthesis Service page on the official website of GenScript) and send it to gene@genscript.com

Order Query

How to query?

1. Log in to your GenScript account
2. Click Account Name - User Center
3. Click "My Order/Query" in the taskbar on the left of the page
4. Select "Gene Synthesis" in the Order Type
5. Click the order number to enter the "Order Details" page to view the order progress. For delayed or difficult orders, please email us for consultation and confirmation. We will reply and follow up as soon as possible.

For delayed or difficult orders, please email us for consultation and confirmation. We will reply and follow up as soon as possible.

Log on GenScript website
↓
User Center
↓
My Order/Query
↓
Select Service
↓
Click the Order Number

GenScript has always been committed to meeting the needs of its customers and to bringing advanced technology to millions of laboratories.

More events
Please follow us on “**GenScript Reagent Service**”

Gene Synthesis Service Handbook 2022 Edition

Memo No. _____

Date / /