GenScript USA Inc.

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Piscataway, NJ 08854
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Email:
For Sales: order@genscript.com
For General Inquiry: info@genscript.com
For Molecular Biology: gene@genscript.com
For siRNA: sirna@genscript.com
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For Protein: protein@genscript.com
For Antibody: antibody@genscript.com
For Chemical: chemical@genscript.com
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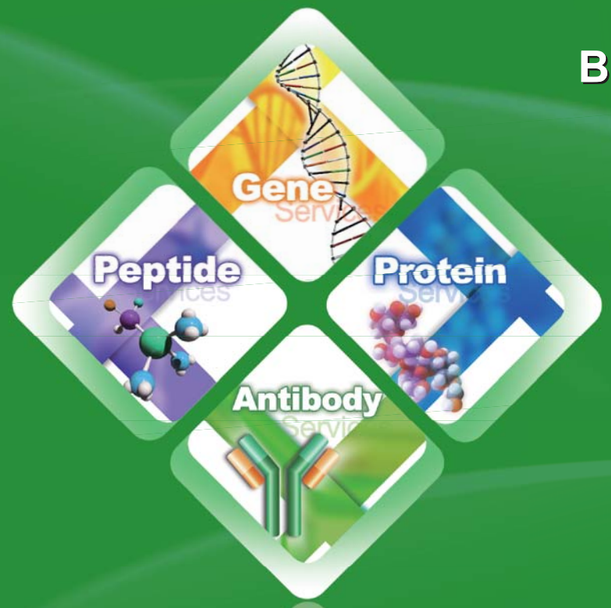
For Technical Support: support@genscript.com



GenScript

Biological Service Guide

2008-2009

Your one-stop wet lab for biology!

Your one-stop wet lab for biology!

GenScript
The Biology CRO

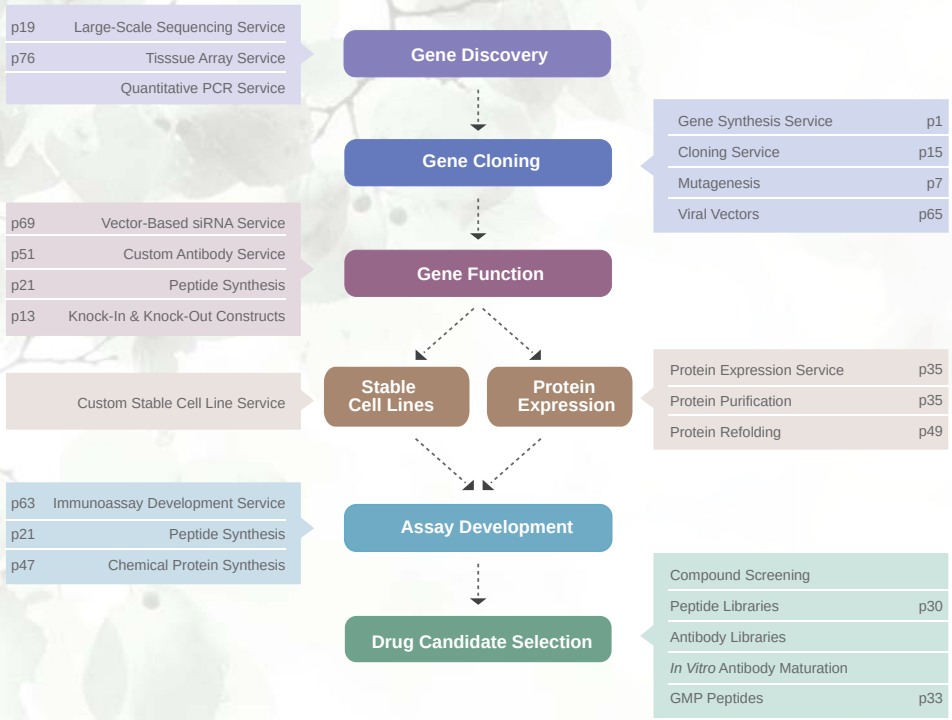
GenScript USA Inc. —— *Your one-stop wet lab for biology!*

GenScript USA Inc. founded in 2002, is a biotech company and contract research organization (CRO), specializing in custom services for biological and pharmaceutical research. We offer our customers a one-stop solution for all outsourcing needs, from gene discovery and target identification to gene function studies and clinical trials, minimizing paperwork, procurement and transportation activities, delivering cost-effective and environmentally friendly resolutions.

Over the years in meeting customers' needs, our researchers have developed many innovative technologies that allow us to maintain our position at the cutting edge of biological research while offering cost-effective solutions for our customers. Our advanced expertise includes GenScript's proprietary technology for custom gene synthesis, custom peptide synthesis, BacPower™ technology for protein expression and purification, and T-Max™ adjuvant and advanced nanotechnology for custom antibody production.

Our dedication to innovation and quality has helped us establish strong partnerships with customers in over 70 countries, including all top 20 pharmaceutical companies in the world. We have also entered strategic partnerships with several companies, including VWR.

GenScript is headquartered in Piscataway, in the heart of New Jersey's pharmaceutical belt and is proud member of the local business community.



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Molecular Biology Services

GenScript Molecular Biology Services

Modern molecular biology techniques have become instrumental to many different kinds of scientific research and development. However, the tricky, repetitive tasks involved in the provision of constructs and reagents may be frustrating and time-consuming. Outsourcing such tasks to a team of expert professionals can streamline a cluttered research schedule, leaving scientists free to shift their talents and time to research and experimentation that can directly answer scientific questions. GenScript provides one expert source for reliable and economical molecular biology outsourcing. With vast experience in gene synthesis, custom cloning, vector design and construction, mutagenesis, ORF cloning and both small- and large-scale plasmid preparation, GenScript's molecular biology team can take on any technical challenge.

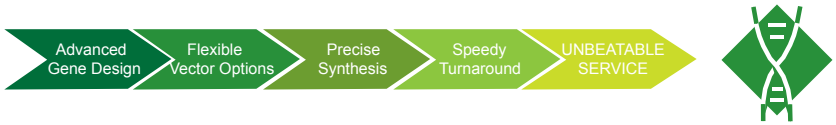
Custom Gene Synthesis Services

(http://www.genscript.com/gene_synthesis.html)

GenScript's proprietary technology produces custom genes *de novo* using only the gene sequence. Delivery is guaranteed. Our technology routinely produces double-stranded synthetic genes of 10,000 bp or longer, in contrast to oligo synthesis, which can only synthesize single-stranded DNA of up to 100 bases.

As one of the pioneer companies in gene synthesis service industry, GenScript has synthesized tens of thousands of genes for customers around the world. Over the years, GenScript has fine-tuned its technology platform, including advanced gene design tools (OptimumGene™) and methods for the synthesis of GC-rich and extremely long genes. These advanced techniques have allowed GenScript to provide its customers with DNA constructs for even the most challenging genes.

Struggling with cloning?
Try Gene-On-Demand™ Service!



Competitive Advantages:

- **Any Gene in Any Vector:** GenScript's technology can synthesize any genes, subclone them into any destination vectors, and deliver them ready-to-use after sequencing confirmation.
- **Advanced Gene Design Algorithms (OptimumGene™):** GenScript's gene synthesis comes with complimentary codon optimization, mRNA secondary structure modification, and other procedures for the highest possible levels of gene expression.
- **Synthesis of Complex Genes:** GenScript routinely synthesizes complex and otherwise difficult genes, such as GC-rich and extremely long genes. Our gene synthesis process is capable of producing synthetic genes of 45,000 bp or longer, and we routinely fill orders for genes of over 10,000 bp.
- **Competitive Prices:** First-time customers are eligible for discount rates of as low as $0.55/bp (€0.35/bp). The minimum charge for each gene is $195.00.

Price Structure:

GenScript's gene synthesis is competitively priced at as low as $0.55/bp (€0.35/bp). A 1,000 bp gene costs only $550.00 (€350.00), including codon optimization service using our OptimumGene™. The client retains all rights to the sequence data and related intellectual property. Precise, efficient gene synthesis can provide an ideal replacement for PCR cloning.

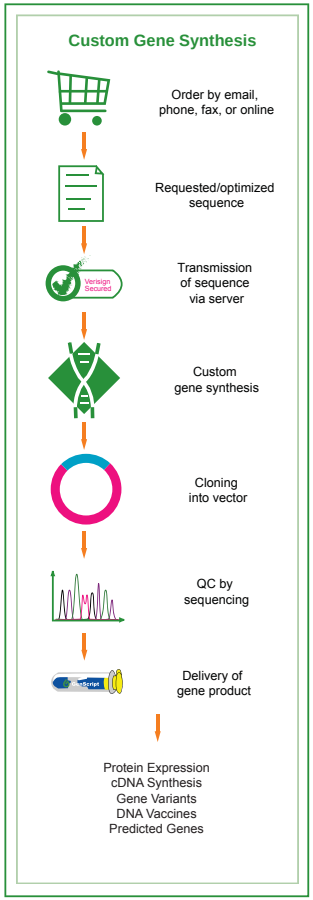
Cat. No.	Price
SC1010	Starting at $0.55/bp (€0.35/bp)

* $0.55/bp (€0.35/bp) for first-time gene synthesis orders (applicable to genes of up to 2 kb with no complex sequences. See GenScript.com for promotion code).
* The minimum charge for each gene is $195.00.
* Free cloning into our standard vector pUC57.
* Additional $295.00 for cloning into GenScript expression vector pGS-21a.
* Additional $295.00 for subcloning into a commercial vector.
* Additional $600.00 for subcloning into a customer-supplied non-commercial vector.
* If for any reason we cannot subclone the gene into a non-standard vector, the gene will be delivered in pUC57 and all subcloning fees will be waived.
* Contact us for quotations on complex sequences.

Delivery Specifications:

Gene	Standard delivery time (Business days)
0-1,000 bp	12 days
1,001-3,000 bp	17 days
> 3,000 bp	Upon request

- 4 µg lyophilized plasmid DNA containing the custom gene
- Stab culture of *E. coli* transformed with the plasmid containing the custom gene (not available to international customers)
- Sequence chromatograms of custom gene (electronic)
- Construction map of the plasmid (electronic)
- Alignment file printouts
- Quality assurance certificate



Email: info@genscript.com Tel: 1-732-885-9188

Molecular Biology Services

Custom Gene Design and Codon Optimization (OptimumGene™):

Expression of a native gene in a heterologous host often involves sequence preference incompatibility, which may result in low or no expression. GenScript's gene design software (OptimumGene™) focuses on sequence optimization for high protein expression levels. Our proprietary design algorithms optimize codon usage preference, RNA secondary structure, GC content, repetitive sequences, and other factors to boost protein expression. Many of our customers have reported dramatic increases in protein expression after using GenScript gene design software.

- **Addition or Removal of Restriction Enzyme Cutting Sites:** GenScript can add or remove RE cutting sites during gene design to facilitate downstream applications.
- **Fusion Protein Design:** Any epitope tag sequence, such as His or GST, or protease cutting site can be incorporated into the designed gene.
- **Creation of Gene Variants (Mutant Forms):** Multiple variant forms (or variant libraries) can be designed for functional study and screening.

Ordering:

Orders can be placed by email, phone, fax, or online with a formal PO (Purchase Order) or credit card. We recommend that you submit your DNA sequence via our Secure Web Server, but we also accept sequences through email.

Order online: https://www.genscript.com/ssl-bin/order_gene

Order by email: gene@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

Selected Publications:

- Sandra *et al*. J. Biol. Chem. May 2008; 283(19): 13428 - 13436.
- Shaun *et al*. Proc. Natl. Acad. Sci. USA. Apr 2008; 105(15): 5879 - 5884.
- Valeria *et al*. Plant Physiology. Apr 2008: 1515 - 1527.
- Rodney *et al*. Proc. Natl. Acad. Sci. USA. Mar 2008; 105(11): 4370 - 4375.
- Stéphanie *et al*. Mol. Biol. Cell. Mar 2008; 19(3): 912 - 928.
- Santanu *et al*. Cancer Res. Feb 2008; 68(3): 700 - 706.
- Wiriya *et al*. Eukaryot. Cell. Feb 2008: 268 - 278.
- Liu *et al*. Physiol Genomics. Feb 2008: 343 - 351.
- Sven *et al*. Nucleic Acids Res. Jan 2008; 36(1): 245-252.
- Damià *et al*. Proc. Natl. Acad. Sci. USA. Dec 2007; 104(51): 20540 - 20545.

Large-Scale Gene Synthesis Services

(http://www.genscript.com/gene_synthesis_large_scale.html)

Gene synthesis plays an important role in modern biology research, especially in structural genomics and functional genomics. To expose the mysteries of organism, to decode protein functions, to probe the regulatory mechanisms, and to study signal and metabolic pathways that control vital phenomena, together provide a broad stage to exhibit the roles of synthetic genes, that often require large-scale production of synthetic genes. GenScript provides large-scale gene synthesis to meet these increasing demands of modern molecular biology and systems biology.

Our large-scale gene synthesis capabilities are based on several proprietary advanced technologies, including the followings:

- OptimumGene™ gene design tool, which optimizes DNA sequences for the highest possible expression in any systems.
- High-performance GS DNA polymerase, which significantly reduces PCR mutation rate.
- GeneScript's cloning technology, which greatly facilitates cloning and assembly of genes and gene fragments.
- State-of-the-art automated DNA sequencers, including DNA analyzer 3730xl and MJ Tetrad PCR machines.

We have *de novo* synthesized more than tens of thousands genes and constructs, ever delivered more than 6,000 clones in three months on a single project. We routinely synthesize constructs with length of 10 kb, and complex genes with extremely high or low of GC content, repetitive sequences, and strongly secondary structure. Our record of gene synthesis is more than 50 kb in length.

Our advanced gene synthesis technology applies to all our gene manipulation services:

- Mutagenesis - for as little as $295.00 per mutation
- The construction of mutant libraries

Ordering:

Orders can be placed by email, phone, fax, or online with a formal PO (Purchase Order) or credit card. We recommend that you submit your DNA sequence via our secure web server, but we also accept sequences through email.

Order online: https://www.genscript.com/ssl-bin/order_gene

Order by email: gene@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

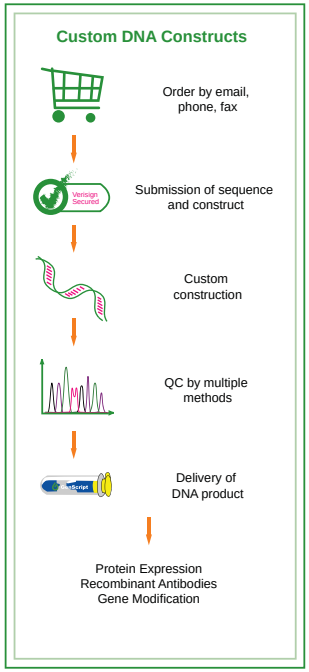
Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

Struggling with cloning?
Try Gene-On-Demand™ Service!

Molecular Biology Services

Custom DNA Constructs Services

(http://www.genscript.com/dna_constructs.html)



The creation of quality DNA constructs remains a time-consuming and tedious part of molecular biology process, especially for those whose areas of expertise lie elsewhere. Outsourcing DNA construct preparation can free researchers' talents for more appropriate tasks, improving productivity. GenScript offers a full spectrum of DNA construct formation services. Our DNA construct department has the capacity and the expertise to produce tailored, ready-to-use DNA constructs for any application. Our large-scale oligo synthesis facilities and vast experience allow us to offer excellent services at very competitive prices starting at **as low as $295.00.**

Key Features:

- Advanced Gene Design (OptimumGene™)
- Synthetic Genes of up to 45 kb
- Subcloning into Any Vector
- Any Mutagenesis
- Delivery of Ready-to-Use Constructs
- Comprehensive Upstream and Downstream Services

Custom Constructs Services:

- PCR cloning and subcloning
- Site-directed and swapping mutagenesis
- Gene manipulation via insertion, deletion, rearrangement, etc.
- DNA vaccine constructs
- SNP and alternative splicing variants
- Knock-out constructs
- Hairpin constructs
- Protein expression constructs
- cDNA cloning
- Large-scale plasmid production
- Low-endotoxin plasmid preparation

Pricing:

GenScript's custom DNA constructs services are very competitively priced, starting at $295.00, an equivalent of only reagent cost of a typical DNA construction project not including time investment.

Struggling with cloning?
Try Gene-On-Demand™ Service!

GenScript's custom DNA construct services can build constructs to your exact specifications. We guarantee both the delivery and fidelity to your specified sequence. Our constructs are delivered ready-to-use without any further subcloning required. Our proven reliability will allow you to plan your project with confidence and finance it with transparency.

Quotations and Ordering:

Please send quotation requests via our secure web server or by email. In the body of the message, please include the following:

1. The sequence and the name of the gene
2. The name of the vector carrying the gene and any other relevant details
3. The destination vector into which you would like the gene subcloned
4. The restriction sites to be used, eliminated, or introduced and their locations
5. A detailed description of any mutagenesis desired
6. A detailed description of any modification, such as the addition of a tag sequence
7. The quantity of the final constructs required
8. Any other special requirements

Orders can be placed by email, phone, or fax with a formal PO (Purchase Order) or credit card. Please submit your gene sequence via email or our secure web server with the information listed above, and send the gene(s) with your full contact information and a detailed description of the order to DNA Constructs, GenScript USA Inc., 120 Centennial Ave., Piscataway, NJ 08854, US.

Order by email: gene@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

Selected Publications:

- Kim *et al*. J. Biol. Chem. Jul 2006: 21256-21265.
- Arnon *et al*. Blood. 2004, 103(2): 664-672.

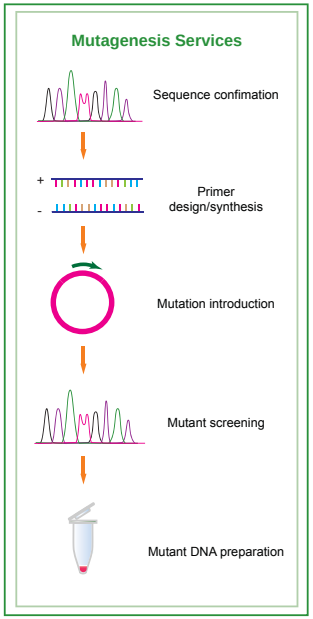
Related Services:

- Custom Gene Synthesis Services
- Custom Plasmid Preparation Services

Molecular Biology Services

Mutagenesis Services

(http://www.genscript.com/mutagenesis.html)



Mutagenesis is central to molecular biology, facilitating research in a variety of fields, including studies of gene regulatory elements, DNA-protein interaction, protein structure/function, enzyme active sites, and novel proteins.

GenScript offers advanced mutagenesis services powered by its sophisticated gene synthesis technology and high performance GS DNA polymerase. Our services include point mutations, deletions, and insertions. They can be customized to fit any scientific application.

Competitive Advantages:

- **Unparalleled Accuracy:** GenScript's high performance GS DNA polymerase ensures accuracy of mutants, eliminating creation of unwanted mutations.
- **Unlimited Sites:** Using its sophisticated mutagenesis technology, GenScript can introduce mutations at any site.
- **Mutation on Large Construct:** Our technology is optimized to introduce mutations, insertions, and deletions to constructs as large as up to 8 kb (including target gene and its vector).
- **Comprehensive Service Package:** We offer comprehensive upstream and downstream services, including template sequencing, expression vector construction, and protein expression and purification.

Cat. No.	Price per Mutagenesis Project
SC1023	Starting at $295.00

* The list price is only for genes less than 1 kb in length.
* For longer gene, if template sequencing is required, an additional $100.00 fee applies per kb.
* One mutation is defined as any combination of mutations within a 10-base frame.

Sample Submission Requirements:

Please provide following information:

- Complete sequence of the template including target gene and its vector
- Mutation specifications
- 2 µg template DNA is required, if starting material is DNA
- Sufficient amount of culture, if starting material is bacterial culture
- Maps and antibiotic resistance of the template and destination vectors

Struggling with cloning?
Try Gene-On-Demand™ Service!

Delivery Specifications:

Our typical turnaround is about 10 business days. Our delivery package includes the following:

- 4 µg lyophilized destination vector containing your gene
- Stab culture of *E. coli* transformed with destination vector containing your gene (Only for U.S. customers)
- Sequence chromatograms of your gene (electronic)
- Construct maps (electronic)
- Quality assurance certificate

Services:

GenScript can introduce any mutation into a gene using our advanced mutagenesis technologies, including point mutations, deletions, and insertions. Our mutagenesis service pipelines include the following:

- **Sequence Confirmation:** The sequence of template DNA will be confirmed by sequencing upon request.
- **Primer Design/Synthesis:** Primer design and synthesis for mutagenesis are included.
- **Mutation Introduction:** Mutations are introduced by PCR.
- **Mutant Screening:** Every mutation is verified by sequencing.
- **Mutant DNA Preparation:** GenScript can manufacture mutant DNA plasmid up to kilogram scale with required purity and endotoxin levels.

Quotations and Ordering:

For quotation requests, you may contact us by email, phone or fax. Most questions may find their answers on our Frequently Asked Questions page. However, we recommend our secure web server. In the body of the message, please include the following:

1. Complete sequence of the template including target gene and its vector.
2. Whether template sequence verification is needed.
3. Specify desired mutations.
4. Description of destination vector, including cloning sites, copy number, and maps.
5. Sample format: plasmid DNA or bacterial culture.

Orders may be placed by email, phone or fax with either a formal PO (Purchase Order) or credit card. We recommend that you submit above listed information via our secure web server, and send your samples with full shipping information to Mutagenesis Services, GenScript USA Inc., 120 Centennial Ave., Piscataway, NJ 08854, US.

Order by email: gene@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

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Molecular Biology Services

Synthetic Gene Variant Library Services

(http://www.genscript.com/synthetic_library.html)

In vitro molecular optimization is a very efficient means of generating mutant proteins with improved or novel properties, identifying regulatory sequences, and probing for structurally and functionally critical residues. Synthetic libraries constructed using the *in vitro* molecular optimization method provide one useful approach to the systematic study of protein properties, regulation, and function.

GenScript's strong expertise in *de novo* gene synthesis allows us to synthesize complex protein libraries without any dramatic increase in cost. Our synthetic gene variant library services include site-directed mutagenesis libraries, sequential permutation scanning libraries, and randomized and degenerated libraries.

Services:

1. Site-Directed Mutagenesis Libraries

GenScript combines its expertise in *de novo* gene synthesis and site-directed mutagenesis into an excellent site-directed mutagenesis libray construction service. In these libraries, any given residue can be substituted with any of other 19 common amino acids, creating systematic combinations of amino acid mutations that reveal any significant pattern.

The final delivery of our site-directed mutagenesis library includes the following:

- Up to 4 µg of the customized vector
- Mixed-mutagenesis library up to 20 variants for each position, delivered as one small library
- Separated variants
- Sequence verification information
- Statistical analysis of nucleotide distribution at the mutation sites

2. Sequential Permutation Scanning Libraries

Sequential permutation scanning outperforms standard alanine/cysteine scanning by replacing each amino acid with all 20 amino acids simultaneously. For each codon of interest, a small, site-saturated library is constructed. This library can be delivered as a pool or in a separated format for any substitution variant (19 in total).

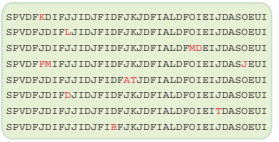
The final delivery of our sequential permutation library includes the following:

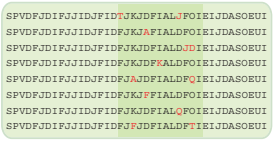
- Up to 4 µg of the mutation constructs
- Mixed-mutagenesis library up to 20 variants for each position, delivered as one small library
- Separated variants (optional)
- Sequence verification information
- Statistical analysis of nucleotide distribution at the mutation sites

3. Randomized and Degenerated Libraries

With our advanced degenerated oligonucleotide techniques, GenScript can generate any form of randomization or degeneration of the full-length gene in a synthetic DNA fragment. GenScript's *in vitro* library synthesis technology can introduce random substitutions on a controlled level with maximum flexibility.

The randomized and degenerated libraries can be delivered in any of three different formats:





- **Non-Amplified Libraries:** Glycerol stock of total non-amplified library of up to 10^9 transformants
- **Amplified Libraries:** Glycerol stock of amplified transformants or 5 µg of linear DNA ready for cloning
- **Cloned Libraries (Amplified or Non-Amplified):** Glycerol stock of transformants subcloned into customer's vector of choice

4. Small-Scale Trial

Please try our service for site-directed mutagenesis at a price starting at as low as $295.00/mutation.

Quotations and Ordering:

For questions and quotation requests, please use our secure web server. However, you may also contact us by email, phone, or fax.

Orders can be placed by email, phone, or fax with a formal PO (Purchase Order) or credit card. Please submit your DNA/protein sequences and degenerated or mutant positions online via our secure web server. If you prefer, however, you may submit your sequence by email.

Order by email: gene@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

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Related Services:

- Custom DNA Constructs Services
- Mutagenesis Services
- Shotgun Library Services
- Knock-Out and Knock-In Vector Construction Services

Molecular Biology Services

Shotgun Library Services

(http://www.genscript.com/shotgun_library.html)

Shotgun libraries are one efficient way of generating DNA sequences and of identifying specific genes from cloned DNA fragments in BAC or cosmid vectors. GenScript provides high-quality shotgun library construction and sequencing services from a variety of sources and formats including BAC, PAC, Cosmid, and Fosmid. Clones within the shotgun libraries can be tailored to carry inserts within a narrow size range. Our final delivery includes transformed cells or frozen subclones arrayed on 96-well plates, ready for prep and sequencing.

Key Features:

- **Quality Template:** GenScript's quality DNA preparation ensures a high-quality library template.
- **Efficient Cloning:** The narrow, controlled size range of the inserts improves cloning efficiency.
- **Large-Scale Sequencing:** GenScript's large-scale and high-throughput DNA sequencing capabilities facilitate library sequencing.
- **Cloning of Difficult Regions:** GenScript has extensive experience in cloning so-called unclonable DNA regions, such as AT- and GC-rich DNA, repeats, and hairpins.

Service Specifications:

GenScript offers BAC, PAC, Cosmid, and Fosmid shotgun libraries and library sequencing services.

1. **Library Construction:**
   - DNA purification and quality analysis
   - Shotgun library construction with randomly sheared DNA inserts of 1.5-3 kb
   - Subcloning of DNA fragments into GenScript's pLY cloning vectors
   - PCR screening of the clones containing inserts
   - Plasmid purification of selected clones
   - Transformation and glycerol stock production
   - Assembly of overlapping sequences
2. **Library Sequencing:**
   - Plating, picking, and arraying colonies into 96-well format
   - High-throughput sequencing on ABI 3730xl DNA Analyzer
   - Contiguous alignment and assembly
   - Up to 99% coverage
3. **Library Quality Control:**
   - Less than 5% *E. coli* genomic DNA contamination
   - 1.5-3 kb inserts

Delivery Specifications:

The final delivery includes either transformed cells or frozen cultures of subclones arrayed on 96-well plates, ready for DNA preparation and sequencing. Upon request, GenScript can provide DNA extraction and sequencing services and subclone trimming and assembly services.

- Shotgun libraries of individual clones or plasmids with small DNA inserts
- QA/QC data including sequencing data of the 96 clones

Quotations and Ordering:

You may contact us for quotation requests by phone or fax listed below. However, we recommend that you send your quotation requests via our secure web server or by email to gene@genscript.com. In the body of the message, please include the following:

1. Relevant details regarding the starting clone, including vector background and insert size
2. Desired insert size of subclones
3. Detailed service requirements including desired delivery specifications

Orders can be placed by email, phone, fax, or online with either a formal PO (Purchase Order) or credit card. Please submit your plasmid DNA or stab cultures of the respective clones and detailed project requirements to Shotgun Library Construction, GenScript USA Inc., 120 Centennial Ave., Piscataway, NJ 08854, US.

Order by email: gene@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

Related Services:

- Custom DNA Constructs Services
- Large-Scale DNA Sequencing Services
- Synthetic Gene Variant Library Services
- Knock-Out and Knock-In Vector Construction Services

Struggling with cloning?
Try Gene-On-Demand™ Service!

Molecular Biology Services

Knock-Out and Knock-In Vector Construction Services

(http://www.genscript.com/targeting_vector_construction.html)

The construction of reliable targeting vectors is a prerequisite for the generation of genetically engineered animals. GenScript's advanced molecular biology platform has provided more than 160 targeting vectors to customers worldwide. These targeting vectors have been successfully used in traditional and conditional knock-out, knock-in, and many other genetic modification projects.

Key Features:

- PCR amplification up to 20 kb
- *De novo* gene synthesis-based quick cloning techniques
- Efficient knock-out and knock-in vector construction
- Time- and cost-effective

Service Specifications:

1. **Vector Construction for Traditional Knock-Out (Conventional Knock-Out)**

   Traditional knock-out involves deleting or disabling both copies of a specific gene. This can be highly advantageous for both biomedical research and drug development. GenScript has developed several powerful technology platforms for efficient and precise generation of most standard and conditional knock-out targeting vectors, by combining *de novo* gene synthesis and quick cloning techniques.

   Special promotion: Our standard service starting at $2,800, if sufficient BAC DNA is provided containing 3' and 5' homolog arms (≤ 4 kb) and free of complex sequences (repeats, high or low GC content), and destination vector supplied is commercially available.

2. **Vector Construction for Conditional Knock-Out (Tissue-Specific or Developmental Gene Targeting)**

   Conditional knock-out involves deleting or disabling a gene in only a particular organ, tissue, or cell type or only during a certain development stage. GenScript provides targeting vectors that can be tailored for inactivation of specific genes in specific tissues in a temporally specific manner. Our scientists have years of experience in inserting *lox*P and FRT sequences and modified DNA sequences into customized targeting vectors.

3. **Vector Construction for Knock-In**

   Reporter gene knock-in provides a more predictable expression pattern than random integration (transgenic methods). Similar to its conventional knock-out service, GenScript offers targeting vectors for efficient and precise genetic engineering with a variety of useful traits, such as site-specific modifications in specific genes and reporter gene knock-in.

4. **Modification of Targeting Vector or BAC Construction**

   GenScript has established several simple and effective methods for the modification of plasmids and BACs, allowing precise engineering, unlimited cloning and subcloning, and mutagenesis of DNA molecules of any size.

Delivery Specifications:

The turnaround time for targeting vector projects is usually less than four weeks. Our typical delivery includes the following:

- 4 µg targeting vectors
- Restriction enzyme digestion map of the vectors
- Sequencing data covering the junction regions
- Sequencing data covering the arms

Optional Features:

- 100 µg targeting vectors
- Linear targeting vectors
- Targeting vectors with ultra-low endotoxin

Quotations and Ordering:

You may contact us for quotation requests by phone or fax listed below. However, we recommend that you send your quotation requests via our secure web server or by email to gene@genscript.com.

Orders can be placed by email, phone or fax with either a formal PO (Purchase Order) or credit card. Please send any genes and/or vectors to Gene Department, GenScript USA Inc., 120 Centennial Ave., Piscataway, NJ 08854, US.

Order by email: gene@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

Related Services:

- Custom DNA Constructs Services
- Synthetic Gene Variant Library Services
- Shotgun Library Services

Struggling with cloning?
Try Gene-On-Demand™ Service!

Molecular Biology Services

PCR Cloning/Subcloning Services

(http://www.genscript.com/pcr_cloning.html)

Are you tired of PCR cloning and subcloning? GenScript provides PCR cloning and subcloning services to free your energy and time from routine cloning for more creative research. Our service is highly flexible to any specific set of project requirements. The starting materials can be PCR products, plasmid DNA or bacterial culture. Our typical turnaround is 14 business days depending on the nature of the project.

Pricing*:

Cat. No.	Price per PCR cloning or subcloning
SC1017	Starting at $295.00*

* The above list price is only for genes shorter than 1 kb. For longer genes that require full sequencing, we add an additional $100.00 per kb for screening and sequencing.
* The destination vector must be a commercially available vector.

Sample Submission Requirements:

Please provide the following information:

- The complete sequence of the template including the target gene and its vector
- 2 µg template DNA is required, if starting material is DNA
- A sufficient amount of culture if starting material is bacterial culture
- Maps, antibiotic resistance sites, and cloning sites of destination vectors

Delivery Specifications:

Our delivery package includes:

- 4 µg lyophilized destination vector containing your gene
- Stab culture of *E. coli* transformed with destination vector containing your gene (Only for US customers)
- Sequencing data of each clone (electronic)

Quotations and Ordering:

For quotation requests, you may contact us by email, phone or fax. However, we recommend our secure web server. In the body of the message, please include the following:

1. Complete template sequences including gene and vector
2. Description of desired destination vector and cloning sites
3. Sample format: PCR products, plasmid DNA, or bacterial culture

Orders may be placed by email (gene@genscript.com), phone (1-732-885-9188) or fax (1-732-210-0262) with either a formal PO (Purchase Order) or credit card. We recommend that you submit above required information via our secure web server.
Please submit the samples along with above information and detailed shipping information to Gene Department, GenScript USA Inc., 120 Centennial Ave., Piscataway, NJ 08854, US.

Custom Plasmid Preparation Services

(http://www.genscript.com/custom_plasmid_preparation.html)

The quality of a plasmid can determine the success of an experiment. Sensitive research systems, such as mammalian cells, are highly sensitive to plasmid quality. Using impure plasmids riddled with endotoxins may cause an expensive or critical experiment to end in a failure.

GenScript's plasmid preparation services provide ultra-pure plasmid DNA, both individual constructs for research labs and large quantities for biotech suppliers and pharmaceutical companies. Our protocols minimize DNA shearing and increase plasmid integrity. Our ultra-low endotoxin plasmids are customized for transfection and gene therapy studies.

For biotech suppliers, we provide complete vector plasmid manufacturing services. These services include industry-scale plasmid production, batch tube aliquoting, labeling, packaging, and step-by-step total QC management. Our services are cost-effective and provide ready-to-market deliverables.

Key Features:

- **Flexible Scale:** GenScript's plasmid preparation platform is highly flexible and can deliver grams or milligrams of plasmid with equal ease, suitable for both individual customers and large-scale plasmid preparation.
- **Ultra-Low Endotoxin Levels:** Upon request, GenScript will deliver plasmids with ultra-low endotoxin levels.
- **Stringent QC:** GenScript's plasmid preparation SOPs ensure plasmid quality.
- **Secure and Convenient Online Ordering System:** Our online ordering system allows customers to order products and services, track project status, and access data reports.
- **Cost-Effective and Ready-to-Use:** GenScript's plasmid preparation service is highly cost-effective and delivers ready-to-use products.

Special Features:

- Flexible scale: 100 µg to 1,000 mg
- Prepared from high- and low-copy plasmids
- Predominantly, supercoiled
- User-friendly online ordering system

Applications:

- Mammalian transfection
- Automated sequencing
- Gene therapy studies
- Restriction analysis
- *In vitro* transcription
- Labeling, ligation, and cloning
- DNA vaccine studies
- Preclinical toxicology

Quality Control:

GenScript provides the following specifications for its plasmid DNA preparation service:

- $A_{260/280}$ of 1.8-2.0
- Standard concentration of 1 mg/ml
- Excellent homogeneity (supercoiled)
- Visibly undetectable amounts of RNA and genomic DNA

Molecular Biology Services

Pricing:

Cat. No.	Service	Description	Price
SC1089	Standard Plasmid Prep Service (up to 2 mg*)	Plasmid Preparation from 1 from 1 L LB Medium	$243.00
SC1090	Plasmid Prep Service High-Copy** (10 mg)	Preparation of 10 mg DNA from High-Copy Plasmids	$761.00
SC1091	Plasmid Prep Service Low-Copy (10 mg)	Preparation of 10 mg DNA from Low-Copy Plasmids	$1,014.00
SC1092	Plasmid Prep Service High-Copy (20 mg)	Preparation of 20 mg DNA from High-Copy Plasmids	$1,413.00
SC1093	Plasmid Prep Service Low-Copy (20 mg)	Preparation of 20 mg DNA from Low-Copy Plasmids	$1,884.00
SC1094	Plasmid Prep Service High-Copy (50 mg)	Preparation of 50 mg DNA from High-Copy Plasmids	$3,261.00
SC1095	Plasmid Prep Service Low-Copy (50 mg)	Preparation of 50 mg DNA from Low-Copy Plasmids	$4,347.00
SC1096	Plasmid Prep Service High-Copy (100 mg)	Preparation of 100 mg DNA from High-Copy Plasmids	$6,159.00
SC1097	Plasmid Prep Service Low-Copy (100 mg)	Preparation of 100 mg DNA from Low-Copy Plasmids	$8,694.00
SC1098	Plasmid Prep Service	Customized Custom Plasmid Preparation	Request a Quotation

Cat. No.	Service	Description	Price
SC1099	Low Endotoxin Grade (< 20 mg Prep)	Endotoxin specification < 30 EU/mg for up to 20 mg prep	$134.00
SC1100	Low Endotoxin Grade (50 mg Prep)	Endotoxin specification < 30 EU/mg for 50 mg prep	$403.00
SC1101	Low Endotoxin Grade (100 mg Prep)	Endotoxin specification < 30 EU/mg for 100 mg prep	$671.00
SC1102	Ultralow Endotoxin Grade (< 20 mg Prep)	Endotoxin specification < 5 EU/mg for up to 20 mg prep	$224.00
SC1103	Ultralow Endotoxin Grade (50 mg Prep)	Endotoxin specification < 5 EU/mg for up to 50 mg prep	$671.00
SC1104	Ultralow Endotoxin Grade (100 mg Prep)	Endotoxin specification < 5 EU/mg for up to 100 mg prep	$1,119.00
SC1105	Bio-Burden Assay	Bio-burden assay	$80.00
SC1106	Host Protein Assay	Test for host proteins by BCA	$80.00
SC1107	Endotoxin Assay	Test for endotoxins by LAL	$80.00
SC1108	Restriction Analysis	Restriction digestion	$80.00

* Yields for standard plasmid prep service (1 L prep) may vary depending on the characteristics of the individual plasmids. Final concentration will be ≈1 mg/ml. For all other plasmid prep services, the final concentration will be 1-5 mg/ml.

** High-yield plasmid > 3 mg/L of LB; Low-yield plasmid 1-3 mg/L of LB.

Ordering:

Orders can be placed by email, phone, fax, or online with a formal PO (Purchase Order) or credit card. We recommend that you submit your sequence via our secure web server.

Order online: https://www.genscript.com/ssl-bin/order_plasmid

Order by email: gene@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

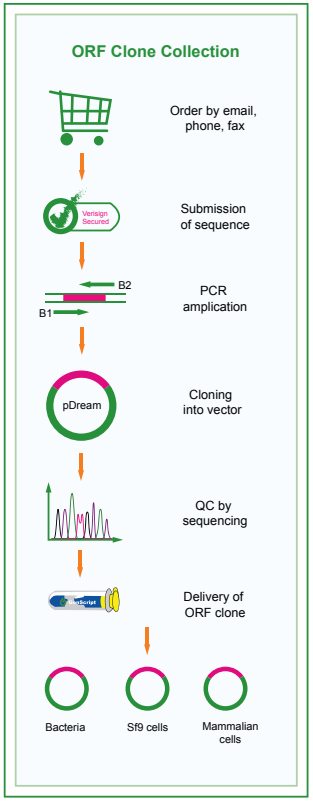
Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

ORF Clone Collection

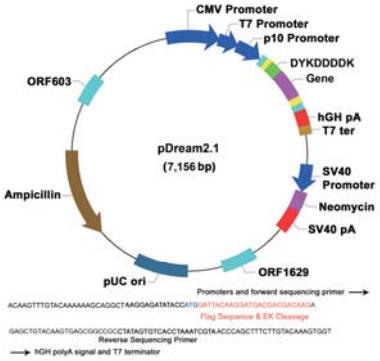
(http://www.genscript.com/genpool.html)

GenScript GenPool™ of open reading frame (ORF) clones contains 1,124,477 ORFs from 90 species, and the number is climbing. Each ORF is cloned into the pDream vector, which allows for expression in bacteria, Sf9 cells, and mammalian cells.



Key Features:

- **Guaranteed Delivery:** Upon request, GenScript will synthesize any gene. If, for any reason, we cannot deliver the final product, the client will receive no charge.
- **Expression-Ready:** GenPool™ ORF clones are cloned into the pDream vector, our versatile proprietary plasmid for protein expression in bacteria, Sf9 cells, and mammalian cells.
- **DYKDDDDK-Tagged:** All genes are marked with a DYKDDDDK tag, which allows for the use of anti-DYKDDDDK antibody (GenScript, A00013) to study the gene in action. The DYKDDDDK-tag from the recombinant protein is easily removed using enterokinase (GenScript, Z01003).



pDream2.1: GenScript's pDream2.1 vector is a versatile protein expression vector that allows efficient cloning and high-level protein expression. The gene of interest can be cloned into pDream2.1 vector directly used for protein expression in bacteria, insect cells, or mammalian cells.

Orders may be placed by email (gene@genscript.com), phone (1-732-885-9188) or fax (1-732-210-0262) with either a formal PO (Purchase Order) or credit card. Please search our GenPool™ collection to identify your favorite genes, and submit your request via our secure online ordering system.

Molecular Biology Services

Large-Scale DNA Sequencing Services

(http://www.genscript.com/sequencing.html)

DNA sequencing is an important part of genetic analysis, with significant consequences not only for basic research such as gene expression, gene regulation, and phylogenetics, but also for applied research such as diagnostics, forensics, and gene therapy.

GenScript offers quick, high-quality, cost-effective DNA sequencing services. These include genomic DNA sequencing, PCR fragment sequencing, and plasmid DNA sequencing. All processes employ state-of-the-art equipment, including the ABI 3730*xl* DNA Analyzer. Our service is compatible with studies involving mutagenesis, polymorphisms, mutant screening, construct generation, genome sequencing, and the cloning of new genes.

We offer a free trial of one sequencing run, with typical readout of about 800 bases.

Key Features:

- Guaranteed Accuracy and Coverage
- Full Bioinformatics Technical Support
- Competitive Prices
- Access to Standard Primers
- Comprehensive Packages
- Fast Turnaround Time

Primer Walking (SC1147):

Primer walking sequencing is the method of choice for sequencing DNA fragments of between 1.3 and 7 kb, and it is applicable to PCR amplicons, plasmid inserts, and even entire plasmids. Our service package includes the following:

- Primer design and synthesis
- Sequencing reactions
- Sequencing
- Removal of dye terminator
- Base calling and quality scoring
- DNA sequence finishing and assembly
- Sequencing data delivery and retrieval via our secure web server

FDA-Quality DNA Sequencing (SC1148):

GenScript performs all FDA submission services in a fully compliant laboratory environment that exceeds the FDA's standards for quality, reliability, and consistency. Our service guarantees the following:

- Detailed sequencing strategy
- Complete double-stranded coverage
- Minimum fourfold repeats
- Absolutely confidentiality

Our final delivery package includes the original electropherograms, consensus sequence, and QC reports. Upon request, we can provide sequence discrepancy reports comparing observed vs expected sequences and any effects of insertions or deletions on amino acid sequence.

Large-Scale Sequencing (SC1149):

GenScript has many years of experience in large-scale sequencing. Our large-scale DNA sequencing services package includes the following:

- High-throughput single- and double-stranded sequencing
- Library sequencing (BAC, PAC, Cosmid, EST)
- High-throughput DNA extraction/purification (96- or 384-well format)
- DNA sequence finishing and assembly
- Data delivery via our secure web server

The final delivery package includes the original electropherograms, consensus sequence, and QC reports.

Sample Submission Requirements:

Template	Concentration	Volume/Reaction	Solvent
Genomic DNA	50-100 ng/μl	≥ 5 μl	ddH_2O or 10 mM Tris (without EDTA)
PCR fragments	20 ng DNA/100 bp	≥ 8 μl	
Plasmid DNA	200-500 ng/reaction	≥ 8 μl	

Please Note:

- Our large-scale sequencing services currently accepts orders of 192 samples or more.
- For combined submissions of templates and primers, the templates must meet our sample submission requirements, and the primers must be submitted in quantities of at least 20 μl (10 pmol/μl or 10 ng/μl) each sample.
- Standard primers [M13(-21), M13 rev, SP6, T7, T3, BGH, GL2, RV3, NCMV30, CCMV24] are available at no extra charge.

Pricing:

Service	Price
Genomic DNA Sequencing	$7.00/sample
PCR Fragments and Plasmid DNA Sequencing	$5.00/sample
Plasmid DNA Extraction from *E. coli* (*E. coli* Recovery, Plasmid DNA Extraction)	Additional $3.00/sample

Quotations and Ordering:

For questions and quotation requests, please use our secure web server. However, you may also contact us by email, phone, or fax.

To submit samples, please download and complete our Sequencing Order Form, and send it to gene@genscript.com. Please also attach a completed hard copy to your samples and se nd them to the address specified on the form.

Orders can be placed by email, phone, or fax with a formal PO (Purchase Order) or credit card.

Order by email: gene@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

Peptide Services

Custom Peptide Synthesis

(http://www.genscript.com/peptide_overview.html)

As one of the pioneers of the life science research service industry, GenScript aggressively seeks to develop new technologies to serve our customers. GenScript has developed and applied our proprietary technology to its peptide-manufacturing pipeline, enabling us to secure the highest success rate in the industry, over 95%. GenScript's peptide synthesis technology can be very useful when it comes to improving product yields and speeding up reaction rates. At present, Our technology is used to improve liquid and solid-phase peptide synthesis, to facilitate chemical coupling, and to ease the chemical modification of proteins.

GenScript Ensures Delivery!

GenScript's proprietary technology includes:

1. Flexible choices of Liquid Phase Peptide Synthesis (LPPS), particularly for shorter peptides, or Solid Phase Peptide Synthesis (SPPS) suited to longer, more complex sequences.
2. Microwave technologies to increase reaction rate and improve peptide yields.
3. Proprietary ligation technology to produce peptides with up to 200 amino acids.

Advantages of GenScript's Technology:

GenScript's peptide synthesis offers researchers the following benefits:

- **Guaranteed delivery:** Merging LPPS, SPPS, microwave technology and proprietary ligation technology allows us to produce peptides as short as two amino acids or complex sequences of up to 200 amino acids.
- **High efficiency:** The use of microwave heating in peptide synthesis can markedly reduce the time required to complete each cycle of coupling and deprotection.
- **Improved peptide yields:** The use of microwave energy can improve peptide yields by preventing unwanted aggregation.
- **Decreased cost:** Microwave technology significantly decreases the cost of peptide synthesis by enhancing chemical reaction rate and reducing the quantity of chemicals required for synthesis.
- **Peptides of any length:** Researchers can use proprietary ligation technology and microwave energy to put short peptides together.
- **Easier modifications:** Microwave energy can also facilitate site-specific peptide modifications.

Services:

- **Standard Peptide Synthesis:** GenScript offers quality peptides at the most competitive prices in the industry. GenScript peptide synthesis technology can synthesize peptide as long as 200 amino acids, a world record of such technology.
- **Express Peptide™ Synthesis:** GenScript's express peptide synthesis service delivers peptides in only 8 business days. Delayed delivery will be discounted to only 45% of the original prices.
- **Peptide Library:** GenScript has developed a rapid high-throughput parallel peptide synthesis platform, providing custom libraries of unbound peptides of 5-15 mer at very competitive prices.
- **Recombinant Peptides:** GenScript's recombinant peptide technology was developed to complement our chemical peptide synthesis service. The combination of the two technologies enables GenScript to provide its customers with peptides of any length and sequence, on any scale.
- **GMP Peptides:** GenScript provides a large-scale GMP peptide service with a capacity of up to 2 kilograms per project. Our comprehensive experience in synthesizing GMP-grade peptides for therapeutic and diagnostic applications gives us an edge over the competition. Consistency, viability, and delivery are guaranteed. See page 33 for details.

Applications:

- Monoclonal and polyclonal antibody production
- Polyclonal antiserum in animals
- Identification/synthesis of posttranslational modifications
- New techniques for separation by chromatography/electrophoresis
- Enzyme specificity and enzymatic mechanisms
- Antibody-antigen interactions
- Biological effects of defined peptides
- Immunization and quantitative receptor-ligand interactions
- Blocking and competition assays of proteases
- ELISA standards for measuring titers of antibodies
- Non-quantitative enzyme-substrate studies
- Non-quantitative peptide blocking studies
- Structure, dynamics, and folding of peptides and proteins via NMR

Quotations and Ordering:

For quotations, you may also contact us by email, phone (1-732-885-9188), fax (1-732-210-0262), or via our secure messaging system.

Order can be placed with either a PO (Purchase Order) or credit card. Our customer service representatives are available 24 hours, Monday through Friday to assist you.

Order by email: peptide@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

Peptide Services

Standard Peptide Synthesis

(http://www.genscript.com/peptide.html)

GenScript's expert staff and world-leading chemical peptide synthesis technology allow us to produce the highest-quality peptides with a success rate well above the industry standard. We offer our customers quality peptides at the most competitive prices in the industry: Every item in our peptide service repertoire is at least 30% less expensive than its counterpart from our peers.

As one of the pioneers of the life science research service industry, GenScript is proud to be the first and only company to offer an Instant Online Quotation service for all synthetic peptides. Our secure online data management system also provides our registered customers with quick and easy access to their project status tracking and data reports.

Competitive Advantages:

Feature	GenScript	Competitor
High success rate	≥ 95%	≤ 75%
Microwave synthesis technology	Yes	No
Flat rates for all peptides	Yes	No
Instant online quotations	Instant	Day(s)
Prices	Starting at $2.95 per amino acid	50% higher

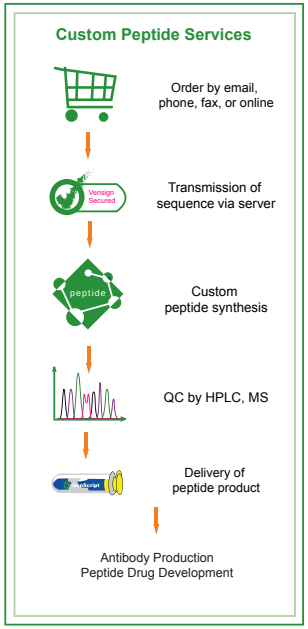
- **High Success Rate:** GenScript's success rate for custom peptide synthesis is more than 95%, far higher than industry's general success rate 75%.
- **Microwave Synthesis Technology:** GenScript has developed and applied microwave technology, which can increase chemical coupling efficiency and contribute to our high success rate.
- **Flat Prices for All Peptides:** GenScript boasts the first and only flat and standard price structure, which completely eliminates the uncertainty and delay that can complicate customers' planning and budgeting of peptide projects.
- **Instant Online Quotations and Easy Online Ordering:** GenScript is the first and only company to offer an instant online quotation system for custom peptides.
- **Competitive Prices:** Our peptides start at as low as $2.95/amino acid. Every item in our peptide service repertoire is at least 30% less expensive than its counterpart from our competitors. In the European market, this figure rises to 50% less expensive.

Other Features:

- **Guaranteed Delivery:** GenScript's proprietary technologies ensure the timely delivery of peptide products. If, for any reason, we are unable to complete the order, all charges will be waived.
- **High Standards of Quality:** All peptides synthesized by GenScript have to pass our stringent quality control, which manages and supervises every step of our service process.
- **Flexible Modification Options:** GenScript offers various peptide modification services including acetylation, amidation, methylation, biotinylation, phosphorylation, and fluorescein and fatty acid labeling.
- **Fast Turnaround Time:** GenScript performs all tasks in-house. Our typical turnaround time is about three weeks, though this may vary depending on the size and complexity of the project.

Delivery Specifications:

All peptide synthesis is subject to GenScript's stringent quality control. The typical delivery consists of lyophilized peptide of the required sequence, purity, and quantity and associated QC reports.



Peptide Modification:

GenScript offers a wide range of peptide modification services.

1. **Phosphorylation**

GenScript has successfully synthesized numerous serine-, threonine-, and tyrosine-phosphopeptides. For peptides containing one or more of these hydroxy-amino acids, selective phosphorylation can be achieved by orthogonal protection or by Fmoc-protected phosphorylated amino acids.

2. **MAP Application**

MAP application is one potent way to produce high-titer anti-peptide antibodies and synthetic peptide vaccines. This system utilizes the a- and e-amino groups of lysine to form a backbone to which multiple peptide chains can be attached.

3. **KLH, BSA, and Ovalbumin**

Peptide antigens are often too small to generate significant immune responses on their own. To solve this problem, these peptides are conjugated to bigger carrier proteins, such as keyhole limpet hemocyanin (KLH), bovine serum albumin (BSA), or ovalbumin.

4. **Amidation and Acetylation**

If the peptide is from an internal sequence of a protein, terminal amidation (C-terminus) or acetylation (N-terminus) will remove its charge and help it imitate its natural structure (amide, $CONH_2$). In addition, this modification renders the resulting peptide more stable towards enzymatic degradation from exopeptidases.

5. **Biotin and FITC**

Peptides labeled with biotin and FITC are widely used in biological assays.

GenScript Ensures Delivery!

Peptide Services

Peptide Purification:

GenScript purifies and analyzes its synthetic peptides using reverse-phase and ion-exchange HPLC. Ion-exchange HPLC is employed when reverse-phase HPLC is inapplicable, such as in the purification of very long peptides or large quantities of peptide. GenScript peptide service offers a selection of purity levels ranging from crude peptide up to more than 98% pure. The following guidelines may help you to find the best purity level for your application.

> 85%: Immunological applications and polyclonal antibody production
> 90%: SAR studies, bioassays
> 95%: NMR, crystallization, *in vitro* bioassays
> 98%: NMR, crystallization, sensitive bioassays

Quotations and Ordering:

For quotations, please use our Instant Online Quotation service. However, you may also contact us by email at peptide@genscript.com, phone (1-732-885-9188), or fax (1-732-210-0262).

Use our online ordering system and either a formal PO (Purchase Order) or credit card to receive GenScript's fastest service. For batch orders, please download and complete the Standard Peptide Batch Order Form and email it to peptide@genscript.com.

Order online: https://www.genscript.com/ssl-bin/order_peptide_chemical

Order by email: peptide@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Selected Publications:

- Nicolas *et al*. J. Immunol. May 2008; 6566 - 6576.
- Betty *et al*. Proc. Natl. Acad. Sci. USA. Apr 2008; 105(15): 5897 - 5902.
- Zhao *et al*. J. Immunol. Apr 2008; 180(8): 5483 - 5489.
- Tonkin *et al*. Proc. Natl. Acad. Sci. USA. Mar 2008; 105(12): 4781 - 4785.
- Ilana *et al*. J. Bacteriol. May 2008; 190(9): 3169 - 3175.
- Fukunaga *et al*. J. Immunol. Mar 2008, 180(5): 3057 - 3064.
- Hall *et al*. J. Biol. Chem. Apr 2008, 283(16): 10396 - 10407.
- Huang *et al*. Antimicrob. Agents Chemother. May 2008: 52(5): 1834 - 1836.
- Dobrowolski *et al*. Hum. Mol. Genet. Feb 2008: 17(4): 539 - 554.

Related Services:

- Custom Antibody Services
- Custom Gene Synthesis Services
- Chemical Protein Synthesis Services

Custom Peptide Price Chart:

GenScript is the first and only company in the industry to offer a standard price structure for peptide synthesis.

Price per amino acid for peptides of 1-30 amino acids:

Size	Crude	Desalt	> 70%	> 75%	> 80%	> 85%	> 90%	> 95%	> 98%
1-4 mg	$4.60	$6.08	$8.16	$10.24	$12.00	$13.60	$14.88	$16.00	$24.00
5-9 mg	$5.60	$7.20	$9.60	$12.00	$13.92	$16.00	$17.44	$18.88	$28.32
10-14 mg	$6.56	$8.32	$11.20	$14.08	$16.48	$18.88	$20.64	$22.08	$33.28
15-19 mg	$6.88	$8.64	$11.84	$15.04	$17.92	$20.96	$22.72	$24.64	$37.12
20-24 mg	$7.36	$9.12	$13.44	$17.76	$20.64	$23.36	$24.64	$28.16	$42.24
25-29 mg	$7.84	$9.60	$14.40	$19.36	$22.24	$24.96	$26.08	$30.56	$45.76
30-39 mg	$8.32	$10.08	$15.52	$20.96	$23.52	$26.08	$28.48	$32.48	$48.80
40-49 mg	$9.28	$11.04	$16.16	$21.44	$24.48	$27.68	$30.08	$34.56	$52.00
50-59 mg	$9.76	$11.52	$17.92	$24.48	$27.36	$30.24	$32.48	$36.96	$55.36
60-79 mg	$11.52	$13.28	$20.96	$28.64	$31.36	$33.92	$36.96	$41.92	$62.88
80-100 mg	$11.84	$13.60	$23.84	$33.92	$37.28	$40.64	$44.32	$49.28	$73.92
1,000 mg	$42.72	$44.48	$73.12	$101.76	$111.68	$121.60	$132.96	$147.68	$221.44

Price per amino acid for peptides of 31-40 amino acids:

Size	Crude	Desalt	> 70%	> 75%	> 80%	> 85%	> 90%	> 95%	> 98%
5-9 mg	$6.72	$8.64	$11.52	$14.40	$16.70	$19.20	$20.93	$22.66	$33.98
10-14 mg	$7.87	$9.98	$13.44	$16.90	$19.78	$22.66	$24.77	$26.50	$39.94
15-19 mg	$8.62	$10.37	$14.21	$18.05	$21.50	$25.15	$27.26	$29.57	$44.54
20-24 mg	$8.83	$10.94	$16.13	$21.31	$24.77	$28.03	$29.57	$33.79	$50.69
25-29 mg	$9.41	$11.52	$17.28	$23.23	$26.69	$29.95	$31.30	$36.67	$54.91
30-39 mg	$9.98	$12.10	$18.62	$25.15	$28.22	$31.30	$34.18	$38.98	$58.56
40-49 mg	$11.14	$13.25	$19.39	$25.73	$39.38	$33.22	$36.10	$41.47	$62.40
50-59 mg	$11.71	$13.82	$21.50	$29.38	$32.83	$36.29	$38.98	$44.35	$66.43
60-79 mg	$13.82	$15.94	$25.15	$34.37	$37.63	$40.70	$44.35	$50.30	$75.46
80-100 mg	$14.21	$16.32	$28.61	$40.70	$44.74	$48.77	$53.18	$59.14	$88.70
1,000 mg	$51.26	$53.38	$87.74	$122.11	$134.02	$145.92	$159.55	$177.22	$265.73

Price per amino acid for peptides of 41-50 amino acids:

Size	Crude	Desalt	> 70%	> 75%	> 80%	> 85%	> 90%	> 95%	> 98%
15-19 mg	$9.63	$12.10	$16.58	$21.06	$25.09	$29.34	$31.81	$34.50	$51.97
20-24 mg	$10.30	$12.77	$18.82	$24.86	$28.90	$32.70	$34.50	$39.42	$59.14
25-29 mg	$10.98	$13.44	$20.16	$27.10	$31.14	$34.94	$36.51	$42.78	$64.06
30-39 mg	$11.65	$14.11	$21.73	$29.34	$32.93	$36.51	$39.87	$45.47	$68.32
40-49 mg	$12.99	$15.46	$22.62	$30.02	$34.27	$38.75	$42.11	$48.38	$72.80
50-59 mg	$13.66	$16.13	$25.09	$34.27	$38.30	$42.34	$45.47	$51.74	$77.50
60-79 mg	$16.13	$18.59	$29.34	$40.10	$43.90	$47.49	$51.74	$58.69	$88.03
80-100 mg	$16.58	$19.04	$33.38	$47.49	$52.19	$56.90	$62.05	$68.99	$103.49
1,000 mg	$59.81	$62.27	$102.37	$142.46	$156.35	$170.24	$186.14	$206.75	$310.02

- The minimum fee for any peptide is $120.00.
- The prices listed above include the cost of purification and mass spectroscopy. There are no hidden fees.
- Our fees for large-scale peptide synthesis (from grams to kilograms) are also extremely competitive. Please ask for a quotation by email, phone, fax, or online.

Peptide Services

Peptide Modification Price Chart:

Modification	Code	0-49 mg	50-499 mg	500-1,000 mg
D-Amino Acids	{D-AA}	1aa+$80.00	1aa+$200.00	1aa+$300.00
(L) 1-NAL	{L-1-NAL}	1aa+$80.00	1aa+$200.00	1aa+$400.00
(L) 3-PAL	{L-3-PAL}	1aa+$80.00	1aa+$300.00	1aa+$500.00
(L) 4-CL-PHE	{L-4-CL-PHE}	1aa+$80.00	1aa+$250.00	1aa+$350.00
2-Methyl Alanine	{2-Me-ALA}	1aa+$80.00	1aa+$120.00	1aa+$160.00
Abu	{Abu}	1aa+$80.00	1aa+$120.00	1aa+$160.00
Acetylation at alpha amine group	{Ac-LYS}	1aa+$160.00	1aa+$240.00	1aa+$320.00
Acetylation at the side chain	{LYS-Ac}	1aa+$80.00	1aa+$120.00	1aa+$160.00
Aib	{Aib}	1aa+$80.00	1aa+$120.00	1aa+$160.00
Biotin Lysine	{biotin-LYS}	1aa+$320.00	1aa+$480.00	1aa+$640.00
Citrulline	{CIT}	1aa+$80.00	1aa+$120.00	1aa+$180.00
Cysteine (Acm)	{Acm-CYS}	1aa+$80.00	1aa+$120.00	1aa+$160.00
Cysteine (tBu)	{tBu-CYS}	1aa+$80.00	1aa+$120.00	1aa+$160.00
D-Gamma-GLU	{D-gamma-GLU}	1aa+$160.00	1aa+$240.00	1aa+$320.00
Dinitrobenzylation (LYS)	{dnp-LYS}	1aa+$200.00	1aa+$296.00	1aa+$400.00
Gamma-GLU	{gamma-GLU}	1aa+$120.00	1aa+$179.20	1aa+$240.00
Homocysteine	{HCY}	1aa+$200.00	1aa+$400.00	1aa+$600.00
Homoserine	{HSE}	1aa+$80.00	1aa+$120.00	1aa+$160.00
Hydroxy Proline	{HYP}	1aa+$40.00	1aa+$56.00	1aa+$80.00
Iso Aspartic Acid	{iso-ASP}	1aa+$120.00	1aa+$179.20	1aa+$240.00
Mpa	{MPA}	1aa+$80.00	1aa+$120.00	1aa+$160.00
N-Methylated ALA	{nme-ALA}	1aa+$560.00	1aa+$728.00	1aa+$840.00
N-Methylated Glycine	{nme-GLY}	1aa+$560.00	1aa+$728.00	1aa+$840.00
N-Methylated Isoleucine	{nme-ILE}	1aa+$560.00	1aa+$728.00	1aa+$840.00
N-Methylated Leucine	{nme-LEU}	1aa+$560.00	1aa+$728.00	1aa+$840.00
N-Methylated Methionine	{nme-MET}	1aa+$560.00	1aa+$728.00	1aa+$840.00
N-Methylated Phenylalanine	{nme-PHE}	1aa+$560.00	1aa+$728.00	1aa+$840.00
N-Methylated Serine	{nme-SER}	1aa+$560.00	1aa+$728.00	1aa+$840.00
N-Methylated Threonine	{nme-THR}	1aa+$560.00	1aa+$728.00	1aa+$840.00
N-Methylated Tyrosine	{nme-TYR}	1aa+$560.00	1aa+$728.00	1aa+$840.00
N-Methylated Valine	{nme-VAL}	1aa+$560.00	1aa+$728.00	1aa+$840.00
Oxamic Acid	{OXA}	1aa+$200.00	1aa+$296.00	1aa+$400.00
Penicillamine	{PEN}	1aa+$120.00	1aa+$240.00	1aa+$480.00
Phosphorylation (SER)	{pSER}	1aa+$200.00	1aa+$500.00	1aa+$800.00
Phosphorylation (THR)	{pTHR}	1aa+$200.00	1aa+$500.00	1aa+$800.00
Phosphorylation (TYR)	{pTYR}	1aa+$200.00	1aa+$500.00	1aa+$800.00
Pyroglutamate	{pGLU}	1aa+$40.00	1aa+$56.00	1aa+$80.00
AMC (C-Terminal)	-	1aa+$200.00	1aa+$500.00	1aa+$800.00
CMK (C-Terminal)	-	1aa+$560.00	1aa+$860.00	1aa+$1,160.00
Fatty Acid (N-Terminal)	-	1aa+$80.00	1aa+$120.00	1aa+$160.00
FMK (C-Terminal)	-	1aa+$560.00	1aa+$860.00	1aa+$1,160.00
Formylation (N-Terminal)	-	1aa+$80.00	1aa+$120.00	1aa+$160.00
Myristic Acid (N-Terminal)	-	1aa+$80.00	1aa+$120.00	1aa+$160.00
OSU (C-Terminal)	-	1aa+$560.00	1aa+$728.00	1aa+$840.00
p-Nitroanilide	-	1aa+$300.00	1aa+$500.00	1aa+$700.00
Palmytolyl (N-Terminal)	-	1aa+$80.00	1aa+$120.00	1aa+$160.00
PEN (N-Terminal)	-	1aa+$80.00	1aa+$120.00	1aa+$160.00

Modification	Code	0-49 mg	50-499 mg	500-1,000 mg
Succinylation	-	1aa+$24.00	1aa+$35.20	1aa+$48.00
Acetylation (N-Terminal)	-	1aa	1aa	1aa
Amidation (C-Terminal)	-	1aa	1aa	1aa
Bonzyloxycarbonyl (N-Terminal)	-	1aa	1aa	1aa
BOC	-	1aa	1aa	1aa
1-Pyrenemethylamine	-	$200.00	$296.00	$400.00
Abz/DNP	-	$296.00	$600.00	$900.00
Abz/Tyr (3-NO_2)	-	$296.00	$600.00	$900.00
Amide Cyclic	-	$960.00	$1,248.00	$1,440.00
Biotin (N-Terminal)	-	$80.00	$120.00	$160.00
Biotin-ACP (N-Terminal)	-	$80.00	$120.00	$160.00
BSA Conjugation	-	$200.00	$296.00	$400.00
Bzl (C-Terminal)	-	$200.00	$400.00	$600.00
DTPA (N-Terminal)	-	$360.00	$536.00	$720.00
Et (C-Terminal)	-	$200.00	$400.00	$600.00
HYNIC (N-Terminal)	-	$360.00	$536.00	$720.00
MAPS Asymmetric 4 branches (C-Terminal)	-	$200.00	$296.00	$400.00
MAPS Asymmetric 8 branches (C-Terminal)	-	$200.00	$296.00	$400.00
Me (C-Terminal)	-	$200.00	$400.00	$600.00
NHEt (C-Terminal)	-	$200.00	$400.00	$600.00
NHisopen (C-Terminal)	-	$2,960.00	$2,960.00	$2,960.00
NHMe (C-Terminal)	-	$200.00	$400.00	$600.00
tBu (C-Terminal)	-	$200.00	$400.00	$600.00
tBzl (C-Terminal)	-	$200.00	$400.00	$600.00
FITC (N-Terminal)	-	$200.00	$300.00	$400.00
S-S (1 pair) *	-	$320.00	$480.00	$640.00
KLH Conjugation *	-	$248.00/0-9 mg	$272.00/10-19 mg	$296.00/20-29 mg
EDANS/DABCYL *	-	$200.00/1-9 mg	$720.00/10-19 mg	$960.00/20-29 mg
MCA (N-Terminal) *	-	$200.00/1-9 mg	$300.00/10-19 mg	$400.00/20-29 mg
MCA/DNP *	-	$360.00/1-9 mg	$540.00/10-19 mg	$720.00/20-29 mg
Dansyl (N-Terminal) *	-	$200.00/1-9 mg	$280.00/10-19 mg	$360.00/20-29 mg

* Please request quotations for large quantities and double S-S bridges.

Quotations and Ordering:

For quotations, please use our Instant Online Quotation service. However, you may also contact us by email at peptide@genscript.com, phone (1-732-885-9188), or fax (1-732-210-0262).

Use our online ordering system and either a formal PO (Purchase Order) or credit card to receive GenScript's fastest service. For batch orders, please download and complete the Peptide Batch Order Form and email it to peptide@genscript.com.

Order online: https://www.genscript.com/ssl-bin/order_peptide_chemical

Order by email: peptide@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Peptide Services

Express Peptide™ Synthesis

(http://www.genscript.com/express_peptide_synthesis.html)

The major bottleneck for custom peptide synthesis is the painfully long turnaround time. GenScript now offers a complete solution to this issue. Our Express Peptide™ Synthesis Service guarantees the delivery of peptides within 8 business days, far faster than the industry standard of 2-6 weeks.

GenScript's express peptide synthesis service applies to the peptides that are composed of only natural amino acids, 6-20 mer in length, quantities up to 49 mg, purity in the range of 70-95%, with selected modifications. Our Express Peptide™ Synthesis Service not only offers speed, but also boasts the highest success rate in the industry, instant online quotations, easy online ordering, competitive prices, and a flat and standard price structure.

If for any reason, GenScript is unable to deliver express peptides in 8 business days, the cost of any express peptide will be reduced to 45% of the original prices. Timing starts next business day for orders confirmed before 3:30 PM Eastern Time, otherwise one more business day after.

Key Features:

- **Fast Turnaround time:** Peptides of 6-20 residues in length will be delivered within 8 business days.
- **High Success Rate:** GenScript's solid experience and application of microwave technology ensures the highest success rate of our peptide synthesis in the industry.
- **Instant Online Quotations:** Our instant online quotation system applies to Express Peptide™ Synthesis to facilitate clients' project budgeting and planning.
- **Easy Online Ordering:** Our online ordering system is available for Express Peptide™ Synthesis Service as well, and compatible with both individual and batch orders.

Cat.No.	Price
SC1192	Starting at $240.00 for a peptide

* If request peptide modification, please contact peptide@genscript.com for quotation.

Delivery Specifications:

The typical delivery of our Express Peptide™ Service consists of lyophilized and purified peptides of the required sequence, purity, and quantity, and their HPLC and MS reports.

Quotations and Ordering:

For quotations, please use our Instant Online Quotation service (https://www.genscript.com/ssl-bin/order_express_peptide). However, you may also contact us by email at peptide@genscript.com, phone (1-732-885-9188), or fax (1-732-210-0262).

Use our online ordering system and either a formal PO (Purchase Order) or credit card to receive GenScript's fastest service. For batch orders, please download and complete the Express Peptide™ Batch Quotation/Order Form and email it to peptide@genscript.com.

Custom Peptide Library Service

(http://www.genscript.com/peptide_library.html)

Peptide libraries have become a commanding asset in the fast-growing field of proteomics and its many related subfields, including drug discovery, structure-function studies, bioactive peptide identification, ligand-binding activity identification, epitope mapping, synthetic vaccine generation, antimicrobial peptide production, protein purification, and protein characterization.

To meet the huge demand, GenScript has developed a rapid high-throughput parallel peptide synthesis platform, providing custom libraries of unbound peptides of 5-15 mer at very competitive prices.

Key Features:

- **Optimized Chemistries:** GenScript peptide library synthesis uses optimized chemistries to ensure consistent quality, purity, and quantity.
- **No Cross-Contamination:** Peptides are directly lyophilized in the wells of 96-well plates.
- **Comprehensive Modifications:** Our modification service includes labeling, the incorporation of unnatural amino acids, and peptide cyclization with disulfide bridges.
- **Ready-to-Use Format:** GenScript delivers peptide libraries in 96-well plates.

Pricing:

Cat. No.	Prices[1]	N-Biotin[2]	Amount & Purity[3]	QC	Turnaround
SC1177	$4,950/Plate	Additional $1,250.00	0.5-2.0 mg, Crude	All samples	3-4 weeks

Notes:

1. For orders over 96 peptides, please request quotes.
2. For modifications other than N' biotin, such as fluorescence, unnatural amino acid etc., please request a quotation.
3. The amount and purity may vary depending on the sequences involved.

Service Specifications:

GenScript peptide libraries are suitable for all applications, including epitope mapping. Our custom peptide libraries services are available with minimum order of one plate of 96 peptides. The specifications of our library services are:

1. 1-3 mg each peptide
2. Peptide length of 5-15 mer
3. Modifications including biotin, fluorescence, and unnatural amino acid etc.

Delivery Specifications:

The typical delivery consists of:

- Lyophilized unbound peptides in 96-well format
- Peptide location table
- QC data

Quotations and Ordering:

For quotations, you may contact us by email, phone, or fax. However, we recommend our secure web server. In the body of the message, please include the following:

1. Number of peptides desired
2. Length and sequence of each peptide
3. Minimum quantity and purity requirements
4. Number of overlapping residues, if relevant
5. Modifications and other specifications

Orders can be placed by email, phone, or fax with either a formal PO (Purchase Order) or credit card. Please submit your peptide sequences at peptide@genscript.com using our Peptide Batch Order Form.

Order by email: peptide@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

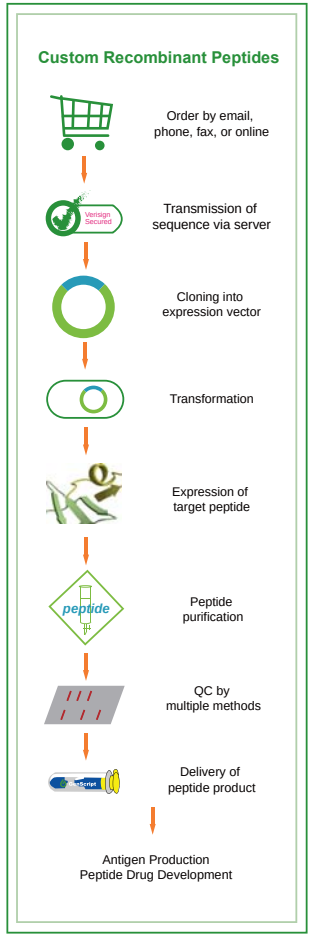
Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

Libraries are collections of useful materials brought together for a specific purpose.

Custom Recombinant Peptide

(http://www.genscript.com/recombinant_pep.html)

GenScript's recombinant peptide service was developed to complement our chemical peptide synthesis service. Conventional chemical peptide synthesis is limited to relatively short and typical sequences. Our proprietary recombinant peptide technology was developed using GenScript gene synthesis techniques. The powerful combination of the two technologies enables GenScript to overcome the limits of chemical peptide synthesis and provide our customers with any peptide of any length, on any scale.



Key Features:

- **Superior Precision:** GenScript's recombinant peptide technology provides custom peptides exactly as requested.
- **Outstanding Procedure:** Conventional chemical peptide synthesis has only limited abilities to synthesize long or complicated peptides, but GenScript's proprietary recombinant peptide technology can handle the toughest possible peptide sequences.
- **Scalable System:** Orders can range from milligrams to kilograms.
- **Competitive Prices:** Our recombinant peptide package provides a cost-effective approach to large-scale, long, and complicated peptide and protein production.
- **Batch-to-Batch Consistency:** With fewer steps than conventional peptide synthesis, recombinant peptide technology produces synthetic peptides with high levels of consistency, time after time.

Applications:

- Synthesize antigens for antibody production
- Perform pathological research
- Perform peptide drug research
- Explore clinical applications

Quotations and Ordering:

For quotations, please use our Instant Online Quotation service. However, you may also contact us by email (peptide@genscript.com), phone (1-732-885-9188), or fax (1-732-210-0262).

Use our online ordering system and either a formal PO (Purchase Order) or credit card to receive GenScript's fastest service. For international orders, we must apply the full charge at the time the order is placed. In the unlikely event that any given order cannot be filled, our guarantee will take the form of a full refund.

Peptide Services

GMP Peptide Synthesis

(http://www.genscript.com/GMP_peptide.html)

The use of peptides in clinical applications is increasing every year. Dozens of peptides are already marketed as drugs and hundreds more are in different stages of clinical development. If you want your peptide idea to reach the patients faster, you should use GMP-grade products from the earliest stages of your project.

GenScript provides a large-scale GMP peptide service. Our SOPs are strict and documented at every step of the manufacturing process. Moreover, our comprehensive experience in synthesizing GMP-grade peptides for therapeutic and diagnostic applications gives us an edge over the competition. Consistency, viability, and delivery are guaranteed.

The generic GMP peptides listed below are currently available from GenScript. Ask for your quotation today.

Cat.No.	Peptide Name	Cat.No.	Peptide Name	Cat.No.	Peptide Name
RP19993	ACTH (Tetracosactide)	RP20024	Exenatide	RP20054	Oxytocin
RP19994	Abarelix	RP20025	Exenatide Acetate	RP20055	Oxytocin Acetate
RP19995	ACTH (1-24) (Hormone human)	RP20026	Fertirelin	RP20056	Pramlintide
RP19996	Alarelin	RP20027	Ganirelix	RP20057	Pramlintide Acetate
RP19997	Alarelin Acetate	RP20028	GHRP-2	RP20058	Protirelin
RP19998	Alexamoreli	RP20029	GHRP-2 Acetate	RP20061	PTH (1-34) (human), Terliparatide
RP19999	Angiotensin Acetate	RP20030	GHRP-6	RP20062	Salcitonin Acetate
RP20000	Angiotensin II	RP20031	GHRP-6 Acetate	RP20063	Salmon Calcitonin
RP20001	Antide	RP20032	Glucagon	RP20064	Secretin Acetate
RP20002	Argireline (Hexapeptide)	RP20033	Glucagon Acetate	RP20065	Sermorelin
RP20003	Argipressin Acetate	RP20034	Glucagon Hydrochloride	RP20066	Sermorelin Acetate
RP20004	Argireline Acetate	RP20035	Gonadorelin	RP20067	Sincalid
RP20005	Atosiban	RP20036	Gonadorelin Acetate	RP20068	Somatostatin
RP20006	Atosiban Acetate	RP20037	Goserelin	RP20069	Somatostatin Acetate
RP20007	Bivalirudin	RP20038	Histrelin	RP20070	Splenopenti
RP20008	Buserelin	RP20039	Lepirudin	RP20071	Taltirelin
RP20009	Carbetoci	RP20040	Leuprorelin	RP20072	Teriparatide Acetate
RP20010	Capaxon	RP20041	Leuprorelin Acetate	RP20073	Terlipressin
RP20011	Cetrorelix	RP20042	Lipopeptide Acetate	RP20074	Terlipressin Acetate
RP20012	Cetrorelix Acetate	RP20043	Lyspressin	RP20075	Thymopentin
RP20013	Deslorelin	RP20044	Lysipressin Acetate	RP20076	Thymopentin Acetate
RP20014	Deslorelin Acetate	RP20045	Matrixyl Acetate	RP20077	Thymosin α1
RP20015	Desirudi	RP20046	Melanotan	RP20078	Thymosin α1 Acetate
RP20016	Desmopressin	RP20047	Melanotan II	RP20079	TP-5
RP20017	Desmopressin Acetate	RP20048	Melanotan II Acetate	RP20080	Triptorelin
RP20018	Dynorphin A (1-13)	RP20049	Nafarelin	RP20081	Triptorelin Acetate
RP20019	Elcatonin Acetate	RP20050	Nesiritide	RP20082	Vapreotid
RP20020	Eledoisin	RP20051	Nesiritide Acetate	RP20083	Vasopressin (Pitressin)
RP20021	Enfuvirtide Acetate	RP20052	Octreotide Acetate	RP20084	Zafirlukast
RP20022	Eptifibatide	RP20053	Ornipressin	RP20085	Ziconotide
RP20023	Eptifibatide Acetate				

Quotations and Ordering:

For quotations, you may contact us by email, phone, fax, or via our secure web server. Please download and complete the Quote/Order Form, send it to us by email or via our secure web server.

Order can be placed by email, phone, fax or via our secure web server with either a PO (Purchase Order) or credit cards. Please download and complete GMP Peptide Order Form and send it to us by email or via secure web server. Our customer service representatives are available 24 hours, Monday through Friday to assist you.

Large-Scale Peptide Synthesis

(http://www.genscript.com/peptide_large_scale.html)

Peptides are often used as tools in functional assays and antibody production, particularly in drug discovery. Some peptides can be used as therapeutic drugs or assay substrates. Moreover, antibodies generated against peptides tend to be more potent and specific than those generated against purified proteins. GenScript's world-leading chemical peptide synthesis technology allows us to produce the high-quality, large-scale, and GMP peptides with the highest success rate in the industry (over 95%).

GenScript peptide synthesis features several advanced technologies, including application of 1) microwave synthesis chemistry, 2) chemical ligation technology, and 3) recombinant peptide expression technology. These technologies enable us to offer our customers unique services such as the synthesis of the long peptide up to 150 residues, express peptide synthesis with guaranteed delivery in 8 business days, and production of GMP level at large scales.

Up to date, GenScript has delivered tens of thousands of peptides to customers worldwide, including very hydrophobic peptides, peptide with multiple disulfide bonds, multi-phosphrylated peptides, cyclic peptides, and extremely long peptides. GenScript ever delivered large scale of peptides on a single order.

Quotations and Ordering:

For quotations, please use our Instant Online Quotation service. However, you may also contact us by email (peptide@genscript.com), phone (1-732-885-9188), or fax (1-732-210-0262). Use our online ordering system and either a formal PO (Purchase Order) or credit card to receive GenScript's fastest service.

Order by email: peptide@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

Protein Services

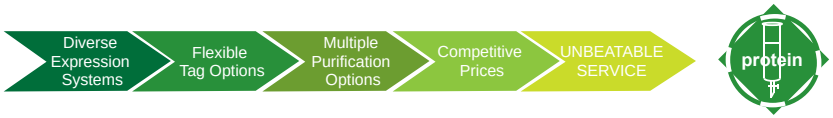
Protein Expression and Purification

(http://www.genscript.com/clone_exp.html)

Protein expression and purification can form bottlenecks in even the most efficient labs. GenScript offers a complete solution to all cloning and protein expression bottleneck issues, providing a variety of protein expression systems, including bacterial, yeast, baculovirus/insect, and mammalian cells, on both small and large scales with a full range of purification options. Our services include gene synthesis, protein expression construction, stable cell line establishment, recombinant baculovirus generation, small-scale protein expression and purification, and large-scale production and purification.

GenScript is committed to meet your protein research needs as your off-campus protein core facility.

Your off-campus protein core facility!



Competitive Advantages:

Feature	GenScript	Competitor
Diverse expression systems	Bacterial, yeast, insect, and mammalian cell systems	One or two systems
Large-scale capabilities	Fermenters, wave mixers, and bioreactors	Fermenters only
Flexible purification options	Affinity column, gel filtration, ion-exchange, and hydrophobic column	Affinity column only
Prices	Very competitive	30% higher

- **Diverse Expression Systems:** GenScript's diverse protein expression systems, which include bacterial, yeast, baculovirus/insect, and mammalian cell systems, are available on both small and large scales.
- **Large-Scale Production:** Our large-scale production facilities, which include fermentors, Wave™ mixers, and bioreactors, can provide pharmaceutical customers with high-purity active proteins of any quantity for target discovery, target validation, high-throughput screening (HTS), and structure-function studies.
- **Flexible Purification Systems:** GenScript provides comprehensive protein purification services including affinity column (GST, Ni-IDA, and protein A, G, and L resins), gel filtration, ion-exchange, hydrophobic column, and HPLC.
- **Competitive Prices:** Every item on GenScript's protein service repertoire is 30% less expensive than that of its US competitors and 50% less expensive than that of its European competitors.

Other Features:

- **Comprehensive Package Services:** GenScript's comprehensive service package includes codon optimization, gene synthesis, and expression vector construction and preparation and antibody production.
- **Flexible Tag Options:** GenScript can deliver the protein to the customer's exact specifications, without any unwanted tags or other markers.
- **Secure and Easy Online Project Tracking:** Through our secure and convenient online tracking system, our clients can monitor their projects' progress, view data reports, and communicate with GenScript project management personnel at any time.

Applications:

GenScript's custom protein services combine our years of experience in protein expression and purification with our industry-leading technology and professional staff. Our expert specialists are ready to support projects involving any expression system, construct, or purification procedure that the client may require.

- Protein-Protein interaction studies
- Enzyme kinetics
- Functional studies
- Structural studies (including protein crystallization, protein structure and NMR)
- Antibody production
- DNA-Protein interactions
- High-throughput screening (HTS) for protein drugs

Quotations and Ordering:

Please send quotation requests via our secure web server or by email to protein@genscript.com. In the body of the message, please include the following:

1. The name of the gene or protein
2. The sequence of the gene or protein
3. Whether or not you have the gene and, if so, the name of its vector
4. Specify whether an affinity tag may be added
5. Specify whether affinity tag should be removed after purification (if applicable)
6. Indicate the preferred host expression system
7. Indicate the amount of culture required in liters
8. Describe the protein's stability level
9. Indicate whether the protein is refoldable if expressed insoluble
10. Specify any special requirements including buffers

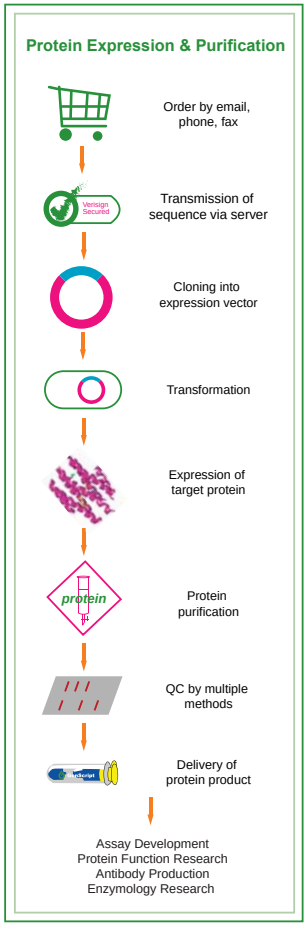
Orders can be placed by email, phone, or fax with a formal PO (Purchase Order) or credit card. We recommend that you submit your protein sequences via our secure web server.

Order by email: protein@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data



Protein Services

Bacterial Expression System

(http://www.genscript.com/custom_protein_bacterial_expression.html)

Bacterial protein expression systems are both the most common and the most economical means of protein expression available today. However, two major problems often prevent researchers from making full use of the systems' advantages:

1) The protein of interest cannot always be expressed using the specific vector/strain combination
2) The proteins expressed in bacterial system are sometimes insoluble

GenScript has developed BacPower™ technologies to tackle hard-to-express and hard-to-dissolve proteins. BacPower™ technology package includes systematic procedures for expression optimization, such as testing of expression vectors and bacterial strains, induction optimization, and refolding.

* Using BacPower™, GenScript can offer customers our Guaranteed Package for protein expression and purification, which guarantees delivery of 3 mg or more of purified soluble protein.
* For proteins that can be easily expressed in bacterial systems, we offer our Standard Package.
* For large-scale protein production, we offer fermentation and large-scale production and purification services.

Guaranteed delivery of 3 mg purified soluble protein, starting from only $2,200!

Guaranteed Package:

Steps	Deliverables
Subclone: Subclone the gene into expression vector(s) *(Customer provides the gene or GenScript synthesizes the gene for an additional fee)*	• Expression construct(s) • Maps and QC data
Expression optimization and verification: 1. Transformation of construct(s) into bacteria 2. Expression optimization: induction time, temperature, and IPTG concentration 3. Coomassie blue stained SDS-PAGE gel 4. Yield estimation and feasibility proposal for large-scale expression (optional)	• Expression protocols • Transformed bacterial strain(s) • Experimental reports and QC data
Expression and purification: 1. Expression in 1 L bacterial culture 2. One-step affinity purification	• 3 mg or more of purified soluble tagged protein • Experimental reports and QC data

Standard Package:

If you do not foresee any problems with the expression of your protein, we recommend our Standard Bacterial Expression Package. It includes subcloning the gene into expression construct, transformation of the construct into bacterial strain, protein expression in 1 L bacterial culture using our standard induction procedure, and one-step affinity purification. This service can be expanded to include tag removal, endotoxin removal, and additional custom purification for a separate fee. Get a quotation today.

Standard Package:

Our Large-Scale Expression Package offers protein induction and purification in batches of up to 1,000 L. We can deliver cell pellets or purified recombinant protein. We also offer other services including tag removal, endotoxin removal, and additional custom purification. Contact us for a quotation.

Quotations and Ordering:

To request a quotation, please download and complete the Quotation/Order Form, and send it to us by email or fax.

To order, please download and complete the Quotation/Order Form and send it to us by email or fax with a formal PO (Purchase Order) or credit card information. You can also submit PO/credit card information by phone or via our Secure Online Quotation Request.

If submitting samples, please mail them together with a hard copy of the completed Quotation/Order Form to: Protein Services, GenScript USA Inc., 120 Centennial Ave., Piscataway, NJ 08854, US.

For questions, or to inquire about the status of your order contact us by email, phone, fax or via our Secure Online Quotation Request.

Our customer service representatives are available 24 hours a day, Monday through Friday to assist you.

Order by email: protein@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

Your off-campus protein core facility!

Protein Services

Bacterial Fermentation Services

(http://www.genscript.com/bacterial_fermentation.html)

Large quantities of high-purity protein are a prerequisite for research involving high-throughput screening, functional analysis and structural biology. Large-scale protein production and purification often form a bottleneck for core facilities as well as individual scientists.

GenScript offers industry-scale bacterial fermentation service as a solution to this bottleneck. Our service is highly customizable to any specific project requirement. The capacity of our bacterial fermentation service is as high as 1,000 L.

Competitive Advantages:

- **High Capacities:** GenScript's fermentation services are available for any scale between 10 and 1,000 L.
- **Large-Scale Purification:** GenScript provides comprehensive large-scale purification services that include affinity column, gel filtration, ion-exchange, and hydrophobic column.
- **Comprehensive Package:** GenScript offers a full range of upstream and downstream services, from gene synthesis and expression vector construction to protein purification and characterization.
- **Competitive Prices:** Our bacterial fermentation services offer the most competitive prices in the industry.

Services:

GenScript's bacterial fermentation services are highly customizable from optimization of expression and growth condition, to large quantity production, purification and characterization. Our bacterial fermentation capacity is as high as 1,000 L. We can produce transformed bacterial cell pastes up to three metric tons, homogeneous recombinant proteins at purity up to 98% and quantities up to 1 kg.

Sample Requirements:

GenScript prefers transformed bacterial culture as starting materials for our fermentation service. Please provide detailed instructions on fermentation conditions using our service order form (available online). If starting material is an expression vector DNA, or if fermentation condition optimization is required, an additional fee applies.

Delivery Specifications:

- Cell pastes
- Batch records
- QC datasheets (target protein detection only)

Pricing:

Starting at $800.00

Quotations and Ordering:

Please send quotation requests via our secure web server or by email to protein@genscript.com. In the body of the message, please include the following:

1. The starting material: expression vector DNA or transformed bacterial culture
2. Specification of bacterial strain, or background information if a non-standard strain is to be used
3. The fermentation volume in liters
4. Growth conditions, including temperature, pH, and any antibiotics and their concentrations
5. The protein's stability and solubility levels
6. Downstream requirements such as purification, and characterization

Orders can be placed by email, phone, or fax with either a formal PO (Purchase Order) or credit card. Please download and complete an order form, send it to us by email or fax. A hard copy of a completed order form should be submitted along with the starting material to Protein Services, GenScript USA Inc., 120 Centennial Ave., Piscataway, NJ 08854, US.

Order by email: protein@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

Selected Publications:

- Jenna *et al*. J. Biol. Chem. Apr 2008; 283(16): 10716 - 10726
- Enrique *et al*. FASEB J. Jan 2008
- Lynn Huang *et al*. J. Biol. Chem. Mar 2008; 283(12): 7616 - 7627
- Nathan *et al*. Protein Sci. Dec 2007; 16(12): 2677 - 2683
- Samir *et al*. Mol. Cell. Proteomics. Sep 2007: 121 - 131
- Stavros *et al*. J. Immunol. Sep 2007; 179(6): 4187 - 4192
- Yanchun *et al*. FASEB. J. Aug 2007: 2474 - 2485
- Brando *et al*. Infect. Immun. Feb 2007; 75(2): 838 - 845

Your off-campus protein core facility!

Protein Services

Yeast Expression System

(http://www.genscript.com/custom_protein_yeast_expression.html)

GenScript's yeast expression system combines the best features of bacterial and eukaryotic expression systems. It is ideal for the large-scale production of recombinant eukaryotic proteins. Our yeast expression system incorporates high yields, high productivity, chemically defined media, and mammalian-like product processing with stable and durable production strains to dramatically lower protein production costs. GenScript employs a transgenic yeast strain to glycosylate recombinant proteins in the same manner as mammalian cells, making it practical to produce proteins with increased applicability in human therapies. This yeast expression system also provides creative and reliable approach to the expression of proteins that are difficult or impossible to express in other systems.

Advantages:

- Rapid Transient Expression
- Mammalian-Like Proteins
- Cost-Effective
- ^{15}N- or ^{13}C-Labeled Protein Expression

Service and Delivery Specifications:

Service	Description	Delivery
Generation of recombinant yeast vector	• Amplification/isolation of target gene or synthetic gene of interest and cloning into yeast expression vector • Transformation of the expression clone into yeast and selection of transformants	• Expression vector with insert (5 μg) • Verified sequence file • Glycerol stock with vector • Documentation of procedures
Pilot expression analysis and optimization	• Screening of positive transformants by PCR to verify gene integration • Testing for expression of the recombinant protein by Western blot analysis	• Expression data • Documentation of expression condition and analysis
Small-scale expression from one to five liters	• Verification of gene expression by SDS-PAGE and Western blot analysis • Small-scale expression from one to five liters	• Cell pellet • Expression data
Large-scale protein production and purification	• Large-scale production up to 100 L • Protein purification by affinity column, ion-exchange, gel filtration, and hydrophobic column • Removal of tags	• Yeast paste, from 10 L to three metric tons • Purified proteins • QC data • Documentation of procedures

Quotations and Ordering:

Please see details on Page 40.

Baculovirus/Insect Cell Expression System

(http://www.genscript.com/custom_protein_baculovirus_insect_expression.html)

GenScript's baculovirus expression service package includes both virus production and large-scale protein production, suitable for the pharmaceutical and biotechnological industries and academic institutions. GenScript has pioneered methods for the secretion of recombinant proteins from baculovirus-infected insect cells. We can produce milligram amounts of recombinant protein, suitable for functional screening and biological testing using either the customer's or our own purification processes. Our flexible services have considerable scale-up capacity: We can produce up to 500 L per project.

GenScript's protein expression specialists work closely with clients to clone and express full-length recombinant proteins from full-length cDNAs, EST sequence information, and genomic sequences, providing service and expertise at all stages of protein expression and production.

Advantages:

- Scale-Up of Virus Inoculums and Protein Production in Suspension
- ^{15}N- or ^{13}C-Labeled Expression

Service and Delivery Specifications:

Service	Description	Delivery
Generation of recombinant bacmid DNA	• Amplification/isolation of the gene or synthetic gene of interest into a baculoviral expression vector • Isolation of recombinant bacmid DNA	• Expression vector with insert (5 μg) • Verified sequence file • Glycerol stock with vector • Documentation of procedures
Generation of a low-titer viral stock	• Transfection of insect cells (Sf9, Sf21, Hi5) with the recombinant bacmid DNA • Testing for expression of the recombinant protein by Western blot analysis	• Expression data • Plaque-purified BV virus stock with titer • Documentation of expression condition and analysis
Amplification of recombinant baculovirus and generation of a high-titer viral stock	• Generation of 10-200 ml of high-titer viral stock from low-titer stock of virus • Determination of virus titer using qPCR • Confirmation of virus titer by plaque assay	• Expression data • Plaque-purified BV virus stock with titer • Documentation of expression condition and analysis
Large-scale protein expression	• Infection of insect cells with high-titer virus stocks • Post-transfectional harvest of insect cells and supernatant	• Cell pellets • Expression data
Protein purification	• Protein purification using 6xHis-tag or GST-tag, MBP-tag, DYKDDDDK-tag under native or denaturing conditions • Identification of the purified protein by Western blot • Dialysis	• Purified proteins • QC data • Documentation of procedures
Extras	• Tag removal followed by purification with ion-exchange chromatography, gel filtration or reverse-FPLC	• Tag-free proteins • Documentation of procedures

Protein Services

Baculovirus Stock and Insect Cell Pellet

(http://www.genscript.com/baculovirus_stock_and_insect_cell_pellet.html)

The inconsistence of batch-to-batch virus titer is a common issue in protein expression using baculovirus-insect cell system, often resulting in a 1-2 week process of virus infectivity restoration. GenScript baculovirus stock and insect cell pellet preparation service offers the solutions to the problem, providing tittered, highly infectious and ready-to-use virus stocks with detailed storage protocols, and infected pellets of Sf9, Sf21, and Hi5 cells for immediate protein purification.

Our services are divided into a series of steps that can be performed either individually or in combination, including the entire protein expression process, from gene synthesis, cloning into baculovirus transfer vector, to recombinant baculovirus construction, high titer recombinant baculovirus production, and infected cell pellet preparation.

Key Features:

- Accurate Virus Titer Determination with qPCR and/or Plaque Assay
- Delivery of Ready-to-use and High Titer Virus Stock
- Detailed Virus Storage Protocols
- Infected Cell Pellets Delivered Ready for Protein Purification

Our Capacities:

	Cell Culture/Month	Working Virus	Stock Virus	Titration
Capacity	500 L	5 L	2 L	50 Assay
Concentration (pfu/ml)	2×10^6	1×10^7	1×10^9	N/A

Services Specifications:

Service	Description	Required Materials	Deliverables	Timeline
Virus Amplification	• Virus amplification • Virus titration by qPCR	5 ml virus stock	Specified quantity of ready-to-use virus stock	2 weeks
Virus Titration and infectivity Assay	• Virus titration by qPCR • Infectivity analysis by plaque assay	2 ml virus stock	3 independent qPCR results and plaque assay results	1 week for viral particles, and 4 weeks for infectivity
Expression Optimization Service	• Virus amplification • Infection of Sf21, Sf9, and Hi5 cell lines with three MOIs • Cells harvested at 36, 48 and 72 hours post infection	5-10 ml virus stock	18 sets of cell pellets from 2-3 ml culture and media for protein yield evaluation	2 weeks
Infected Cell Pellet Service	• Virus amplification • Infection of the chosen cell line • Cell harvest at optimized time point • Cell pellet preparation	100 ml virus stock and expression protocols	Cell pellets ready for protein purification and supernatant of secreted protein	2 weeks (1-5 L), 4 weeks (5-20 L), 8 weeks (≥ 20 L)

Mammalian Cell Expression System

(http://www.genscript.com/custom_protein_mammalian_cell_expression.html)

GenScript recommends its mammalian expression service for cases in which the folding of the proteins is crucial to the customer's intended application and cases in which the internal machinery of *E. coli* is unable to express the protein in sufficient time or quality. Our protein expression team can produce milligram-levels of protein from mammalian cells in less than four weeks. Researchers can then follow up on promising leads in an expeditious manner.

Advantages:

- Post-Translational Modifications and Proper Folding
- Large-Scale Protein Production
- Stable and Rapid Transient Protein Expression

Service and Delivery Specifications:

Service	Description	Delivery
Generation of recombinant vector construct	• Amplification/isolation of the gene or synthetic gene of interest into a mammalian cell expression vector • Verification of the subcloned gene by qPCR and sequencing	• Expression vector with insert (5 μg) • Verified sequence file • Glycerol stock with vector • Documentation of procedures
Transient protein expression	• Transfection of target cells (293, CHO) with recombinant construct DNA • Transient protein expression • Testing for expression of the recombinant protein by Western blot analysis • Establishment of stable cell line	• Expression data • Transient or stable protein expression cell lines • Conditioned media
Small-scale protein expression	• Pilot expression analysis and optimization • Generation of cell bank • Small-scale expression from one to five liters	• Cell pellet • Expression data
Large-scale protein production	• Cell harvest • Testing of expression by Western blot • Large-scale production up to 100 L	• Cell pellet • Expression data
Protein purification and characterization	• Protein purification by affinity column, ion-exchange, gel filtration, or hydrophobic column • Removal of tags • Characterization by Western blot, SDS-PAGE, or sequencing	• Purified proteins • QC data • Documentation of procedures

Quotations and Ordering:

For quotation requests and ordering information of protein services using baculovirus and mammalian expression systems, please see details on Page 40.

Protein Services

Protein Purification and Characterization

(http://www.genscript.com/custom_protein_purification_characterization.html)

GenScript offers several methods of protein purification, allowing customers to choose the ideal level of purity for the intended final application. Each of these options is available for both small and large amounts of protein. GenScript routinely maintains stringent QC and SOPs on its protein purification process. In addition, before shipping, our protein expression experts characterize each target protein to ensure that it meets the customer's stated requirements.

Protein Purification Options:

1. **Chromatography**
   a. Ion-exchange b. Hydrophobic Interaction
   c. Affinity Columns d. Size Exclusion
2. **Purification Tags**
   a. 6xHis b. GST
   c. MBP d. Myc
3. **Proteinases for Tag Removal**
   a. Thrombin b. Enterokinase c. rTev

Protein Characterization:

1. Electrophoresis and Coomassie staining of SDS-PAGE
2. Protein concentration determination
3. Western blot analysis
4. Absorption spectrum

Large-Scale Protein Expression and Purification

(http://www.genscript.com/custom_protein_large_scale_expression_purification.html)

With the rapid growth of the protein drug market and recent advances in proteomics, the supply of large quantitie ctors, combined with our large-scale purification service, allows GenScript to provide its clients in both the public and private research sectors, academia, and all levels of the pharmaceutical industry with protein orders as large as one kilogram.

Capabilities of Different Expression Systems:

Bacteria	Yeast	Insect Cells	Mammalian Cells
1,000 L	500 L	500 L	300 L
Fermentor	Fermentor	Wave™ Mixer	Wave™ Mixer

Capability Specifications:

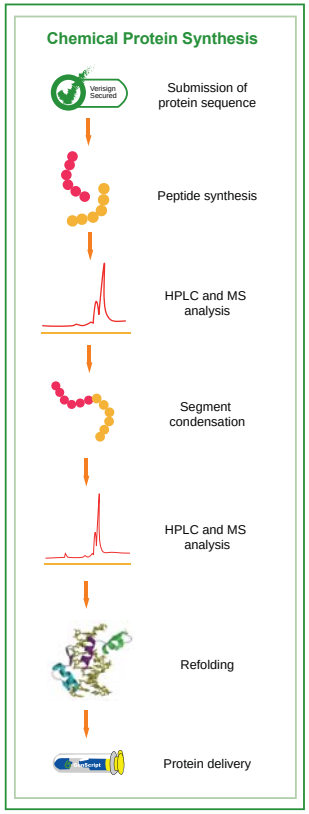
Expression System	Capabilities	Equipment
Bacteria	• Provides transformed bacterial paste for large-scale fermentation, up to three metric tons. • Provides homogeneous recombinant proteins, over 98% purity, for crystallization, and partially purified recombinant proteins, over 70% purity. • Provides large quantities of protein, up to 1 kg.	
Yeast	• Provides yeast cell pellets transformed for large-scale fermentation, up to three metric tons. • Provides homogeneous recombinant proteins, over 98% purity, for crystallization. • Provides partially purified recombinant proteins, over 70% purity. • Provides large quantities of protein, up to 1 kg.	
Baculovirus-Insect Cells	• Provides purified, high titer recombinant baculovirus stock, of up to 10^9 pfu/ml, carrying the customer's gene. • Provides homogeneous recombinant proteins, over 98% purity, for crystallization. • Provides partially purified recombinant proteins, over 70% purity. • Provides large quantities of protein, up to 1 kg. • Provides a large-scale protein production option, up to 500 L, using insect cells and a wave™ mixer system.	
Mammalian Cells	• Provides one single system for the production of final homogeneous recombinant proteins, from gene synthesis to expression, for orders of up to 100 mg. • Permits transient expression of customers' proteins of interest, up to 10 mg in 10 days. • Provides conditioned media and cell pellets from stable cell lines, up to 300 L, using a wave™ mixer system.	

Please send quotation requests via our secure web server or by email to protein@genscript.com. Orders can be placed by email (protein@genscript.com), phone(1-732-885-9188), or fax (1-732-210-0262) with a formal PO (Purchase Order) or credit card. We recommend that you submit your protein sequence via our secure web server.

Protein Services

Chemical Protein Synthesis Services

(http://www.genscript.com/protein_chemical_synthesis)



The expression of proteins in engineered cells has become a mature technology. However, the limitations of this technology still interrupt what ought to be a smooth process. Chemical protein synthesis as a complement to protein expression can overcome those problems. The technology produces functional proteins directly from genome sequence data, allowing researchers to dissect the molecular basis of protein function and examine protein-inspired nanofabrication.

GenScript is the first and only company in the industry to provide a chemical protein synthesis service. Our services are based on our proprietary segment condensation and advanced peptide synthesis technologies.

GenScript can synthesize proteins of up to 200 residues.

Key Features:

- **High Purity:** We can deliver proteins of over 95% purity.
- **High Activity:** Upon request, proteins are delivered refolded to their natural states.
- **Higher Stability:** Unstable proteins, such as proteases, can be stabilized by targeted modifications.
- **Engineered Proteins:** Engineered proteins can be modified to display any unnatural amino acid at any position.

Applications:

The applications of chemical protein synthesis cover a wide range of laboratory and clinical tools and processes:

- **Non-Coded Amino Acids:** Incorporation of non-coded amino acids into proteins.
- **Protein Structure-Function Relationships:** Elucidation of the structural origins of protein function.
- **Protein Backbone Engineering:** Systematic modification of polypeptide backbone structure for protein function studies.
- **Intermolecular Hydrogen Bonding:** Interaction analysis of the protein complex containing backbone-to-backbone amide hydrogen bonds.
- **Mirror Image D-Proteins:** Synthesis of an entire protein with D-amino acids.
- **Protein Signature Analysis:** Signature analysis of self-encoded libraries of protein analogs.
- **Precision Labeling:** Precise labeling at predetermined sites with complete versatility.

Services:

GenScript's chemical protein synthesis provides clients with a comprehensive package of active engineered protein synthesis services, including functional characterization. Every step of our chemical protein synthesis process is subjected to stringent quality control. The activity and purity levels of GenScript's engineered proteins are guaranteed.

Delivery Specifications:

The typical delivery consists of engineered proteins in lyophilized powder form, all possessing the specified sequences, modifications, purities, and quantities. The associated QC reports and functional characterization data, where applicable, are included.

Quotations and Ordering:

Please send quotation requests via our secure web server or by email to peptide@genscript.com. In the body of the message, please include the following:

1. The sequence of the protein.
2. Any modification, specify the position and residue desired.
3. Quantity and purity requirements.
4. Indicate whether the protein should be refolded.
5. Specify any functional characterization requirements.

Orders can be placed by email, phone, or fax with a formal PO (Purchase Order) or credit card. We recommend that you submit your protein sequence and project specifications via our secure web server.

Order by email: peptide@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

GenScript Ensures Delivery!

Protein Services

Protein Refolding Services

(http://www.genscript.com/protein_refolding.html)

Insoluble aggregates, also called inclusion bodies, are one of the major issues facing protein expression in *E. coli*. The insoluble aggregates are non-functional but completely block the progress of research into downstream applications. GenScript's protein refolding services provide a solution to this problem.

GenScript offers its Guaranteed Protein Refolding Service for only $1,950.00 for one-liter system. If, for any reason, we are unable to render a given protein soluble, all charges are waived.

GenScript can simultaneously optimize the refolding up to 20 proteins per order. Our confidence is backed by our proprietary refolding technology, which includes high-hydrostatic-pressure techniques, small-molecule additives, and column-refolding methods.

Services:

Our typical turnaround time is four weeks. GenScript can convert 30-50% of material in insoluble aggregates to soluble refolded protein. GenScript can provide refolded proteins at purity of 85% or greater. The final output is dependent on the total amount of target protein comprising the aggregates. The refolded protein is delivered in customized buffer. The major elements of our protein refolding services include the following procedures:

1. Evaluation of target proteins' biochemical and biophysical properties
2. Refolding optimizations in the 1 L system
3. The particular refolding strategy is selected based on protein's sequence and the structural properties. Typically, our strategies include the following:
   a. Direct dilution
   b. Dialysis and diafiltration
   c. Small molecular assistants:
      - Denaturant
      - Amino acids
      - Polymers: micellar and liposomal
      - Alcohol
      - Reducing/oxidizing reagents
      - Salts: Na/K/Mg-Cl and $(NH_4)_2SO_4$
      - Saccharides: glucose, sucrose, and trehalose
   d. Artificial chaperones: detergent and non-detergent
   e. Matrix-assisted methods: SEC (size exclusion chromatography), HIC (hydrophobic interaction chromatography), affinity column and IEC (ion exchange chromatography)
   f. Chaperon-mediated methods: ATP-dependent and ATP-independent
   g. Gradient methods: pH, Temp, hydrostatic pressure, and denaturant

Sample Submission Requirements:

GenScript accepts stab cultures, plasmid DNA, and glycerol and LB cultures as starting materials so long as expression and purification protocols are provided:

Material	Stab Culture	Plasmid DNA	Glycerol Stock	LB Culture
Quantity	500 µl	2 µg	1 ml	3 ml

Delivery Specifications:

The typical turnaround is four weeks. GenScript can convert 30-50% of material in insoluble aggregates to soluble refolded protein from one-liter expression system. The refolded proteins are delivered at purity of 85% or greater in customized buffer. The protein purity and identity data are determined by Coomassie-stained gels and Western blot analyses using Tag or the customer's designated protein-specific antibody (must be provided by the customer).

Quotations and Ordering:

Please send quotation requests via our secure web server or by email to protein@genscript.com.

Orders can be placed by email, phone, or fax with a formal PO (Purchase Order) or credit card. We recommend that you submit your protein sequence and project specifications via our secure web server.

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Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

Your off-campus protein core facility!

Antibody Services

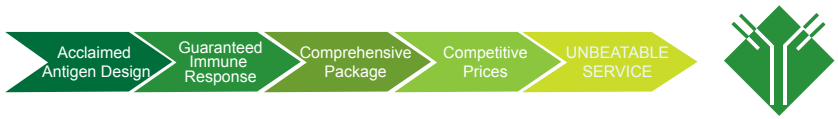
Custom Antibody Services

(http://www.genscript.com/antibody.html)

A reliable analysis of biological materials demands reliable antibodies and antibody services. These in turn demand industry-leading technology and an experienced, professional staff. With state-of-the-art techniques and dedicated specialists, GenScript provides a one-stop solution to all its customers' antibody needs. Our services include recombinant protein expression, peptide design and synthesis, polyclonal and monoclonal antibody production, affinity purification, conjugation, fragmentation, and immunoassay development.

We guarantee:

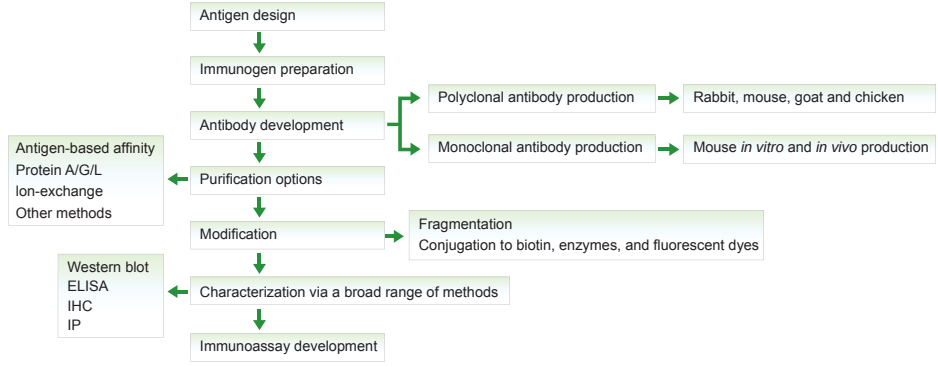
1. **A final product with an ELISA titer of 1:10,000 or better for any host polyclonal antibody project that uses peptide antigens designed, synthesized, and conjugated by GenScript.**
2. **Two ELISA positive clones with any qualified antigen for monoclonal antibody production.**



Competitive Advantages:

Feature	GenScript	Competitor
Advanced antigen design (OptimumAntigen™):	Yes	No
Nanotechnology for antigen preparation	Yes	No
Guaranteed immune response	≥ 1:10,000 ELISA titer for pAb Two ELISA positive clones for mAb	Rare and inferior
Prices	Polyclonal starts at $250.00 Monoclonal starts at $3,800.00	30% higher

- **Advanced Antigen Design (OptimumAntigen™):** The GenScript Antigen Design Tool, OptimumAntigen™, combines the industry's most advanced algorithms with GenScript's time-tested expertise to provide peptide antigens that produce the highest-quality antibodies.
- **Nanotechnology for Antigen Preparation:** Unlike those of many other antibody production companies, GenScript's antigen mixtures are processed down to nanoparticles to maximize immunization efficiency and boost immune response.
- **Guaranteed Immune Response:** For any polyclonal antibody project that use peptide antigens designed, synthesized, and conjugated by GenScript, we guarantee a final antibody product with an ELISA titer of 1:10,000 or better.
- **Competitive Prices:** Every service on our antibody repertoire is at least 30% less expensive than its counterpart from our US competitors. In the European market, this figure rises to 50% less expensive.
- **Comprehensive Package:** GenScript's one-stop antibody services are tailored to each customer's unique needs.



Quotations and Ordering:

To request a quotation, please download and complete our Quick Quotation Request, and send it to us by email or fax.

To order a polyclonal antibody please download and complete our Order Form, and send it to us by email or fax.

To order a monoclonal antibody please download and complete our Monoclonal Antibody Order Form, and send it to us by email or fax.

If submitting antigen, please mail it together with a completed hard copy of the Antigen Submission Form to Antibody Services, GenScript USA Inc., 120 Centennial Ave., Piscataway, NJ 08854, US.

For questions, or to inquire about the status of your order please contact us by phone, email, fax or via our secure web server.

Order by email: antibody@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

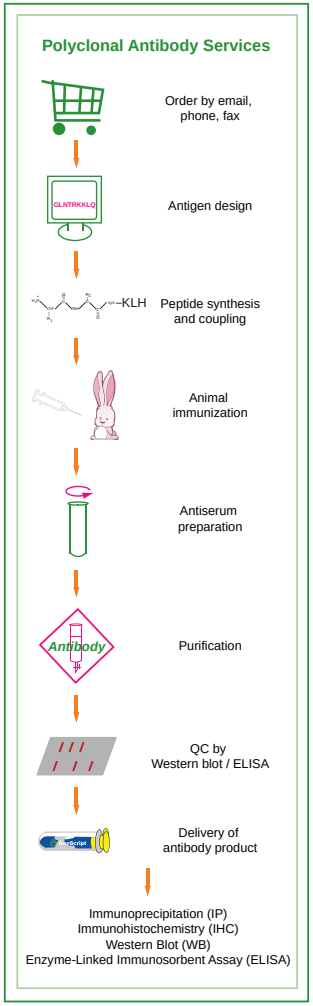
Order by fax: 1-732-210-0262 1-732-885-5878

Best guarantee in the industry!

Antibody Services

Polyclonal Antibody Services

(http://www.genscript.com/polyclonal_antibody_service.html)



Unlike monoclonal antibodies, polyclonal antibodies correspond to multiple epitopes and tend to contain several immunoglobulins. They can be used in immunoassays as primary and secondary antibodies. GenScript produces custom antibodies with antigen peptide purity levels significantly higher than the routine industry standard. Our experienced sales account managers will guide you toward the best selection for your research needs.

GenScript offers a variety of polyclonal antibody production packages including antibody production in multiple animal species such as rabbit, mouse, goat, and chicken. We also provide customers with various conjugation and purification options.

We guarantee a final product with an ELISA titer of 1:10,000 or better for any polyclonal antibody project that uses peptide antigens designed, synthesized, and conjugated by GenScript.

Below are some examples of our service packages:

1. Most Popular:

SC1031: Complete Affinity-Purified Peptide Polyclonal Antibody Package (Rabbit)

Services Included:

1. Peptide synthesis (< 15 aa, > 85% purity, 15 mg)
2. A cysteine is automatically added to the C-terminus or N-terminus of the peptide and conjugated to KLH
3. Two rabbits, pre-immune bleed, four immunizations/rabbit
4. Final bleed
5. Peptide (5 mg) conjugated to affinity resin
6. Affinity-purified antibody
7. ELISA test

Delivery Package:

1. 1 ml of pre-immune serum
2. ELISA results
3. Affinity-purified antibodies
4. 5 mg of unconjugated peptide, MS reports, and HPLC reports

Time Frame:

1. Peptide Synthesis: 2-3 weeks
2. Conjugation: 1 week
3. Immunization: 10 weeks
4. Purification: 1 week
5. ELISA and shipping: 1-2 weeks
6. Total: 15-17 weeks

2. SC1030: Partial Polyclonal Antibody Package (Rabbit)

Services Included:

1. Conjugation to KLH (optional)
2. Two rabbits, pre-immune bleed, four immunizations per rabbit
3. 100-120 ml antiserum from two rabbits
4. ELISA test
5. Antigen provided by the customer: 3-5 mg of peptide or protein is required. The concentration should be > 0.4 mg/ml, and no organic solvents in the antigen solution.

Delivery Package:

1. 2-3 ml of pre-immune serum
2. ELISA results
3. 100-120 ml of antiserum from two rabbits

Time Frame:

1. Conjugation: 1 week
2. Immunization: 10 weeks
3. ELISA and shipping: 1-2 weeks
4. Total: 12-13 weeks

3. SC1015: Complete Peptide Polyclonal Antibody Package (Rabbit)

Services Included:

1. Peptide synthesis (<15 aa, > 85% purity, 10 mg)
2. A cysteine is automatically added to the C-terminus (or N-terminus) of the peptide and conjugated to KLH
3. Two rabbits, pre-immune bleed, four immunizations/rabbit
4. 100-120 ml final bleed from two rabbits
5. ELISA test

Delivery Package:

1. 2-3 ml of pre-immune serum
2. ELISA results
3. 100-120 ml of antiserum from two rabbits
4. 5 mg of unconjugated peptide, MS reports, and HPLC report

Time Frame:

1. Peptide Synthesis: 2-3 weeks
2. Conjugation: 1 week
3. Immunization: 10 weeks
4. ELISA and shipping: 1-2 weeks
5. Total: 14-16 weeks

Antibody Services

4. SC1045: Complete Protein A-Purified Peptide Polyclonal Antibody Package (Rabbit)

Services Included:

1. Peptide synthesis (< 15 aa, > 85% purity, 10 mg)
2. A cysteine is automatically added to the C-terminus (or N-terminus) of the peptide, and conjugated to KLH
3. Two rabbits, pre-immune, four immunizations/rabbit
4. Final bleed
5. Protein A purification
6. ELISA test

Delivery Package:

1. 1 ml of pre-immune serum
2. ELISA results
3. Protein A-purified antibodies
4. 5 mg of unconjugated peptide, MS reports, and HPLC reports

Time Frame:

1. Peptide Synthesis: 2-3 weeks
2. Conjugation: 1 week
3. Immunization: 10 weeks
4. Purification: 1 week
5. ELISA and shipping: 1-2 weeks
6. Total: 15-17 weeks

5. SC1044: Phospho-Specific Polyclonal Antibody Package (Rabbit)

Services Included:

1. Two synthesized peptides, one with a modified amino acid (< 15 aa, > 90% purity, 15 mg) and another without the modified amino acid (< 15 aa, > 70% purity, 10 mg)
2. A cysteine is automatically added to the C-terminus or N-terminus of the peptide for KLH conjugation
3. Two rabbits, pre-immune bleed, four immunizations/rabbit
4. 100-120 ml antiserum from two rabbits
5. Two affinity columns
6. Antibody purification by modified-peptide affinity column and without modified-peptide cross-adsorption
7. ELISA test

Delivery Package:

1. 1 ml of pre-immune serum
2. ELISA results
3. Modified-specific antibodies from two rabbits
4. 5 mg of modified peptide and 5 mg of unmodified peptide, MS reports, and HPLC reports

Time Frame:

1. Peptide Synthesis: 2-4 weeks
2. Conjugation: 1 week
3. Immunization: 10 weeks
4. Purification: 1 week
5. ELISA and shipping: 1-2 weeks
6. Total: 15-18 weeks

Pricing:

Cat. No.	Service Items	Price
SC1047	Partial Polyclonal Antibody Package (Mouse)	$600.00
SC1250	Partial Protein A-Purified Polyclonal Antibody Package (Mouse)	$850.00
SC1046	Complete Peptide Polyclonal Antibody Package (Mouse)	$795.00
SC1049	Complete Protein A-Purified Peptide Polyclonal Antibody Package (Mouse)	$950.00
SC1030	Partial Polyclonal Antibody Package (Rabbit)	$600.00
SC1247	Partial Affinity-Purified Polyclonal Antibody Package (Rabbit)	$850.00
SC1248	Partial Protein A-Purified Polyclonal Antibody Package (Rabbit)	$850.00
SC1015	Complete Peptide Polyclonal Antibody Package (Rabbit)	$795.00
SC1045	Complete Protein A-Purified Peptide Polyclonal Antibody Package (Rabbit)	$950.00
SC1031	Complete Affinity-Purified Peptide Polyclonal Antibody Package (Rabbit)	$950.00
SC1044	Phospho-Specific Polyclonal Antibody Production (Rabbit)	$1,650.00
SC1052	Partial Polyclonal Antibody Package (Goat)	$945.00
SC1050	Complete Peptide Polyclonal Antibody Package (Goat)	$1,145.00
SC1051	Complete Protein G-Purified Peptide Polyclonal Antibody Package (Goat)	$1,145.00
SC1053	Partial Polyclonal Antibody Package (Chicken)	$600.00
SC1054	Complete Peptide Polyclonal Antibody Package (Chicken)	$795.00
SC1055	Complete IgY-Purified Peptide Polyclonal Antibody Package (Chicken)	$950.00
SC1056	Complete Affinity-Purified Peptide Polyclonal Antibody Package (Chicken)	$1,195.00

Quotations and Ordering:

To request a quotation, please download and complete our Quick Quotation Request, and send it to us by email or fax.

To place an order, please download and complete our Order Form, and send it to us by email or fax.

If submitting antigen, please mail it together with a completed hard copy of the Antigen Submission Form to Antibody Services, GenScript, 120 Centennial Ave., Piscataway, NJ 08854, US.

For questions, or to inquire about the status of your order please contact us by phone, email, fax or via our secure web server.

Order by email: antibody@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Related Services:

- Antibody Modification Services
- Antibody Purification Services

Antibody Services

Express Antibody™ Services

(http://www.genscript.com/Express_Rabbit_Polyclona_Antibody_Services.html)

The lengthy and complex procedures involved in antibody production greatly increase the cost and uncertainty of antibody projects. Using nanotechnology and proprietary adjuvants, GenScript provides both confidence and speed in polyclonal antibody production. Our Express Antibody™ Service features the following:

- **Turnaround time of 5-8 weeks**
- **Guaranteed final ELISA titer of 1:5,000**

Key Features:

- **Fast Turnaround:** Our service delivers the requested antibody in 38-58 days.
- **High Efficiency:** Our T-Max™ Adjuvant is twice as efficient as Freund's adjuvant.
- **Superior Quantity:** We use four rabbits for each project to ensure the yield.
- **Free Bundle Service:** Peptide design and carrier conjugation are included free of charge.
- **Guaranteed Immune Response:** GenScript guarantees final ELISA titer of 1:5,000.

Service Packages and Timelines:

1. SC1178: Partial Polyclonal Antibody Package (Rabbit)

Specifications:	Deliverables:	Timeline:
• Antigen submission: a. 5-6 mg peptide or protein b. 0.4 mg/ml or higher c. No organic solvents • Conjugated to KLH (optional) • Four rabbits, pre-immune bleed • Four immunizations/rabbit • 80 ml final bleed from two rabbits • ELISA test	• 2-3 ml of pre-immune serum • ELISA results • 80 ml of antiserum from two rabbits	• Conjugation: 3 days • Antiserum: 36 days • ELISA & Shipping: 7 days • Total: 43-46 days

SC1179: Complete Peptide Polyclonal Antibody Package (Rabbit)

Specifications:	Deliverables:	Timeline:
• Peptide synthesis: a. < 15 mer b. 20 mg c. > 85% purity • Cysteine addition (C- or N-) • Conjugated to KLH (optional) • Four rabbits, pre-immune bleed • Four immunizations/rabbit • 80 ml final bleed from two rabbits • ELISA test	• 2-3 ml of pre-immune serum • ELISA results • 80 ml of antiserum from two rabbits • 5 mg unconjugated peptide • MS and HPLC reports	• Peptide synthesis: 14 days • Conjugation: 3 days • Antiserum: 36 days • ELISA & Shipping: 7 days • Total: 60 days

SC1180: Complete Affinity-Purified Peptide Polyclonal Antibody Package (Rabbit)

Specifications:	Deliverables:	Timeline:
• Peptide synthesis: a. < 15 mer b. 20 mg c. > 85% purity • Cysteine addition (C- or N-) • Conjugated to KLH • Four rabbits, pre-immune bleed • Final bleed • 5 mg peptide conjugated to resin • Affinity purified antibody • ELISA test	• 2-3 ml of pre-immune serum • ELISA results • Affinity-purified antibody • 5 mg unconjugated peptide • MS and HPLC reports	• Peptide synthesis: 14 days • Conjugation: 3 days • Antiserum: 36 days • Purification: 5 days • ELISA & Shipping: 7 days • Total: 65 days

Pricing:

Cat. No.	Service Items	Price
SC1178	Express Service - Partial Polyclonal Antibody Package (Rabbit)	$900.00
SC1179	Express Service - Complete Peptide Polyclonal Antibody Package (Rabbit)	$1,195.00
SC1180	Express Service - Complete Affinity-Purified Peptide Polyclonal Antibody Package (Rabbit)	$1,450.00

Quotations and Ordering:

To request a quotation, please download and complete our Quick Quotation Request, and send it to us by email or fax.

To place an order, please download and complete our Order Form, and send it to us by email or fax.

If submitting antigen, please mail it together with a completed hard copy of the Antigen Submission Form to Antibody Services, GenScript USA Inc., 120 Centennial Ave., Piscataway, NJ 08854, US.

For questions, or to inquire about the status of your order please contact us by phone, email, fax or via our secure web server.

Order by email: antibody@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

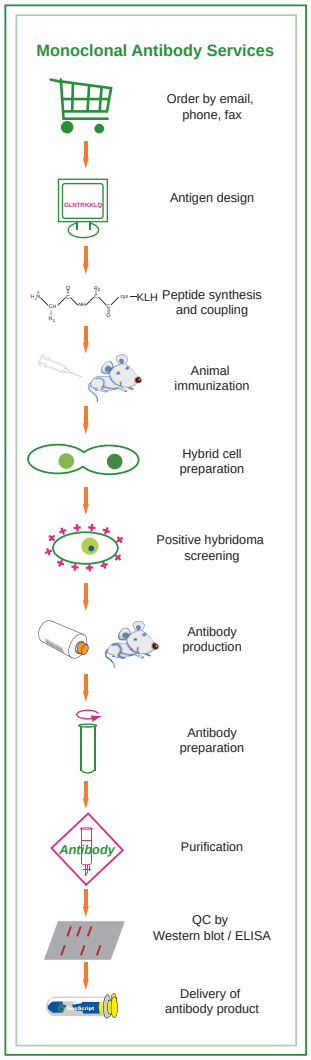
Order by fax: 1-732-210-0262 1-732-885-5878

Related Services:

- Antibody Modification Services
- Antibody Purification Services

Antibody Services

Monoclonal Antibody Services



(http://www.genscript.com/monoclonal_antibody_service.html)

GenScript's monoclonal antibodies are produced from hybridoma cell lines derived from the fusion of myeloma cells and antibody-producing B-lymphocytes. Our staff has successfully produced monoclonal-antibody-secreting hybridomas against proteins, peptides, small organic compounds, polymers, and other types of molecules. GenScript's innovations including advanced antigen design software, proprietary T-Max™ adjuvant, nanotechnology techniques for antigen preparation and state-of-the-art hybridoma technology guarantee the high quality and competitive pricing of our custom monoclonal antibodies. In-house peptide synthesis and protein expression services provide significant time savings and increase the cost-efficiency of your project.

We guarantee: Two ELISA positive clones with any antigen or client pays only $800.00 setup fee.

Our monoclonal antibody service starts at $3,800. All monoclonal antibody services are quotation-based.

Monoclonal Antibody Services:

I. Monoclonal Antibody Packages

SC1041: Complete Peptide Monoclonal Antibody Package (includes peptide synthesis) -- $4,280.00

Service includes:
1. Design, synthesis and conjugation of the antigenic peptide
2. Immunization of 5 mice
3. Splenocyte fusion and ELISA screening
4. Subcloning and isotyping of the positive clones

Delivery Package:
2 positive clones
5 ml of culture supernatant
5 mg of unconjugated peptide

Time Frame: 5-7 months.

SC1040: Partial Monoclonal Antibody Package (antigen supplied by customer) -- $3,800.00

The package includes the same services as SC1041 except peptide design and synthesis.

II. Assemble Your Own Package: Monoclonal Antibody Development, Step-Wise

Cat. No.	Service Items	Price
SC1216	Monoclonal Antibody Project, Phase I: Immunization of up to 5 Balb/c mice with protein antigen, test bleed, ELISA, and evaluation	$800.00
SC1217	Monoclonal Antibody Project, Phase I: Immunization of up to 5 rats with protein antigens, test bleed, ELISA, and evaluation	$1,050.00
SC1218	Monoclonal Antibody Project, Phase I: Immunization of up to 5 Balb/c mice with cell-based antigen, test bleed, ELISA, and evaluation	$1,250.00
SC1219	Monoclonal Antibody Project, Phase II: Cell fusion, screening, positive clone expansion, and isotyping	$1,600.00
SC1220	Monoclonal Antibody Project. Phase III: Subcloning, screening and expansion	$1,400.00
SC1221	Additional Subcloning (in Phase II), per clone	$175.00
SC1223	Monoclonal Antibody Production Additional Antigen Screening and Testing	$450.00
SC1224	Monoclonal Antibody Production Hybridoma Screening Using a Cell-Based Antigen (Cell-Based ELISA)	$1,150.00

III. Anti-Idiotype Monoclonal Antibody Packages

Cat. No.	Service Items	Price
SC1184	Anti-idiotype Monoclonal Antibody Package (Mouse)	$7,999.00
SC1185	Anti-idiotype Monoclonal Antibody Package (Rat)	$8,999.00

IV. Monoclonal Antibody Production

In Vivo (Mouse Ascites)

Cat. No.	Service Items	Price
SC1110	Ascites Production (5 Balb/c Mice)	$350.00
SC1111	Ascites Production (10 Balb/c Mice)	$525.00
SC1112	Ascites Production (20 Balb/c Mice)	$630.00
SC1113	Ascites Production (50 Balb/c Mice)	$1,125.00
SC1114	Ascites Production (100 Balb/c Mice)	$1,880.00
SC1115	Ascites Production (200 Balb/c Mice)	$3,030.00
SC1116	Ascites Production (300+ Balb/c Mice)	Upon request

In Vitro (Roller Bottle Culture)

Cat. No.	Service Items	Price per Liter
SC1117	Roller Bottle Cell Culture (1 L)	$315.00
SC1118	Roller Bottle Cell Culture (2~5 L)	$295.00
SC1119	Roller Bottle Cell Culture (6~10 L)	$260.00
SC1120	Roller Bottle Cell Culture (11~20 L)	$245.00
SC1121	Roller Bottle Cell Culture (21~50 L)	$230.00
SC1122	Roller Bottle Cell Culture (> 50 L)	Upon request

V. Monoclonal Antibody Purification

Cat. No.	Service Items	Price
SC1043	Protein A or G Purification (up to 100 ml of mouse ascites)	$300.00
SC1127	Protein A or G Purification (100-1,000 ml of mouse ascites)	$300.00/100 ml
SC1227	Protein A/G Affinity Purification for up to 2.0 liter of culture supernatant	$415.00
SC1228	Protein A/G Affinity Purification for > 2.0 liter culture supernatant	Inquire
SC1131	Protein L Purification (up to 100 ml ascites)	$400.00
SC1132	Protein L Purification (100-1,000 ml ascites)	$350.00/100 ml
SC1124	Ion Exchange Purification (up to 100 ml ascites)	$420.00
SC1125	Ion Exchange Purification (100-1,000 ml ascites)	$360.00/100 ml
SC1128	Low E.U. Protein A or G Purification (up to 100 ml ascites)	$800.00
SC1129	Low E.U. Protein A or G Purification (100-1,000 ml ascites)	$670.00/100 ml
SC1126	Low E.U. Ion Exchange Purification (up to 100 ml ascites)	$830.00
SC1130	Low E.U. Ion Exchange Purification (100-1,000 ml ascites)	$700.00/100 ml
SC1133	Low E.U. Protein L Purification (up to 100 ml ascites)	$850.00
SC1134	Low E.U. Protein L Purification (100-1,000 ml ascites)	$720.00/100 ml

VI. Cell Line Storage

Cat. No.	Service Items	Price
SC1222	Liquid Nitrogen Storage (10 vials/cell line/year)	$89.00
SC1057	Cell Line Storage (LN2) (6 vials/cell line/year)	$60.00
SC1058	Working Cell Bank (50 vials/cell line)	$350.00
SC1059	Master Cell Bank (100 vials/cell line)	$950.00

Quotations and Ordering:

To request a quotation, please download and complete the Quotation Request Form, and send it to us by email or fax.

To order, please download and complete the Order Form and send it to us by email or fax. You can also submit PO/credit card information by phone or via our secure web server.

If submitting antigens, please mail them together with a hard copy of the completed Antigen Submission Form to: Antibody Services, GenScript USA Inc., 120 Centennial Ave., Piscataway, NJ 08854, US.

For questions, or to inquire about the status of your order contact us by email, phone, fax or via our secure web server.

Order by email: antibody@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Antibody Modification Services

(http://www.genscript.com/antibody_modification_service.html)

GenScript offers many antibody modification options, including antibody labeling and antibody fragmentation. Labeling antibodies with biotin and HRP provides signals for visualization and quantification of the target molecule. In some assays, it is preferable to use only the antigen-binding (Fab) portion of the antibody. For these applications, antibodies may be enzymatically digested to produce either an Fab or an F(ab')2 fragment of the antibody.

Cat. No.	Service Items	Price
SC1060	F(ab')2 Fragmentation (up to 100 mg)	$560.00
SC1061	Biotin Conjugation (up to 20 mg)	$275.00
SC1062	HRP Conjugation (up to 20 mg)	$275.00
SC1063	FITC Conjugation (up to 20 mg)	$275.00

Other Services

GenScript provides these extended services to complement any research strategy.

Cat. No.	Service Items	Price
SC1033	Additional Rabbits	$250.00/rabbit
SC1034	Extended Protocol	$200.00/rabbit
SC1035	KLH Conjugation	$150.00
SC1036	Titer Test by ELISA	$100.00
SC1037	Western Blot Testing	$150.00
SC1196	Pre-Screen (hold for up to 10 days after Bleed)	$19.00/rabbit

Best Guarantee in the Industry!

Antibody Services

Immunoassay Development Services

(http://www.genscript.com/antibody_assay_development.html)

Modern drug discovery demands reliable high-throughput assays for the screening of potential drugs in biological systems. The complexity and long time commitments involved in the creation of such assays frequently make assay development a bottleneck in the drug screening process. GenScript's antibody production and immunoassay development services provide a cost-efficient solution to this problem, delivering validated assays and freeing up your staff and facilities for other projects.

Services:

We offer two basic categories of services:

1) Immunoassay development service for drug screening
2) Immunoassay development service for therapeutic antibody screening

Our services include the following:

- Antigen and immunogen preparation
- Antibody production, purification and modification
- Cell line generation
- Immunoassay development
- Reagent preparation
- Assay kit manufacturing

Delivery Specifications:

The delivery specifications of each service vary depending on the types of services requested and the requirements of the assays. Since every project is designed-to-order, our scientists and project managers will discuss project design, cost estimates, and delivery information with each client. In general, we deliver cell lines, antibodies and conjugates, assay protocols, assay reagents, assay kits, experiment records, and specific data derived from a given project.

Quotations and Ordering:

Please send quotation requests via our secure web server or by email to antibody@genscript.com. You may also contact us by phone or fax, as listed below.

Order by email: antibody@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

Large-Scale Monoclonal Antibody Production Services

(http://www.genscript.com/antibody_large_scale.html)

Antibody production is widely needed for biological research, although difficulties in making antibodies, such as poor immune response, poor specificity and difficulties in obtaining the antigen always exist. GenScript has developed several novel technologies to overcome these obstacles, allowing us to provide high quality and high throughput antibody development and production services. These technologies allow us to offer large-scale monoclonal antibody production and purification services. We can produce your antibodies large-scale in 300 or more mice for ascites production, and in 50 or more liter batches for roller bottle production.

Large-Scale Antibody Production Services

Cat. No.	Service Items	Price
SC1116	Ascites Production (300+ Balb/c Mice)	Upon request
SC1122	Roller Bottle Cell Culture (> 50 L)	Upon request

Large-Scale Antibody Purification Services

Cat. No.	Service Items	Price
SC1127	Protein A or G Purification (100-1,000 ml of mouse ascites)	$300.00/100 ml
SC1228	Protein A/G Affinity Purification for > 2.0 liter culture supernatant	Upon request
SC1132	Protein L Purification (100-1,000 ml ascites)	$350.00/100 ml
SC1125	Ion Exchange Purification (100-1,000 ml ascites)	$360.00/100 ml
SC1129	Low E.U. Protein A or G Purification (100-1,000 ml ascites)	$670.00/100 ml
SC1130	Low E.U. Ion Exchange Purification (100-1,000 ml ascites)	$700.00/100 ml
SC1134	Low E.U. Protein L Purification (100-1,000 ml ascites)	$720.00/100 ml

Related Services

Cat. No.	Service Items	Price
SC1058	Working Cell Bank (50 vials/cell line)	$350.00
SC1059	Master Cell Bank (100 vials/cell line)	$950.00

Quotations and Ordering:

Please send quotation requests via our secure web server or by email to antibody@genscript.com. You may also contact us by phone or fax, as listed below.

Order by email: antibody@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

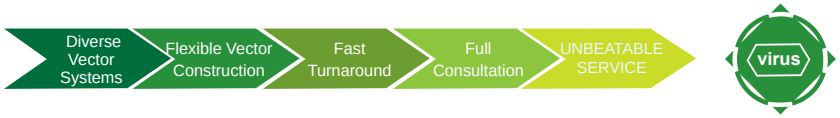
Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

Custom Viral Vector Services

Custom Viral Vector Services

(http://www.genscript.com/virus_overview.html)

GenScript's long experience in gene synthesis and cloning gives us an edge in the area of gene expression. The addition of custom viral vector service to our already strong cloning repertoire allows us to offer clients one centralized source of expertise in molecular biology and protein expression. Our services include design, creation, and production of viral vectors for gene expression and transfer. We offer a wide selection of viral vectors, including adenoviral (AV), adeno-associated viral (AAV), lentiviral (LV), and retroviral (RV). We continually update our procedures to incorporate new techniques and technologies into our viral vector portfolio.



Key Features:

- Diverse Vector Systems
- Flexible Vector Construction
- Fast Turnaround Time
- Associated Human and Mouse cDNA Libraries
- Full Consultation Services

Viral Vector Selection Guide:

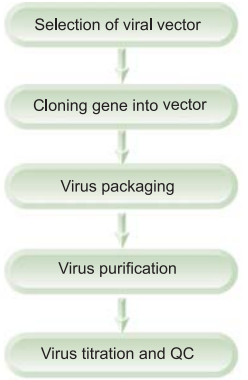
GenScript offers four viral vector systems. The genome size, packaging capacity, and other important features of the four viral vectors are summarized in the table below.

Viral Vector	Viral Genome	Packing Capacity	Tropism	Inflammatory Potential	Vector Forms
Adenovirus (Non-enveloped)	dsDNA	8-40 kb	Broad	High	Episomal
AAV (Non-enveloped)	ssDNA	4.7 kb	Broad, except haematopoietic cells	Low	Episomal (> 90%) Integrated (< 10%)
Lentivirus (Enveloped)	RNA	8 kb	Broad	Low	Integrated
Retrovirus (Enveloped)	RNA	8 kb	Dividing cells only	Low	Integrated

General Viral Vector Construction Procedures:

Although the ideal packaging method for a given gene may vary depending on the viral vector system employed, the general packaging procedure can be summarized as follows:

1. Selection of a viral vector that efficiently transfects target cells without affecting cell viability. In some cases, it is recommended that a pilot study involving a reporter-vector-expressing eGFP or galactosidase be performed.
2. Cloning the gene of interest and the selected promoter into appropriate shuttle vectors and verification of transgene insertion into the shuttle vector by PCR and sequencing.
3. Confirmation of the infectivity of the recombinant virus by transfection assay, and verification of transgene expression by ELISA or immunoblot.
4. Where possible, it is also advisable to show that the transgene product functions as required before proceeding to virus packaging and preparation.



Timeline:

	Description	Timeline
	PCR cloning of the gene of interest	2-3 weeks
	Addition of reporter (optional)	1 week
	Subcloning to shuttle vector	1-2 weeks
	Viral packaging	1-2 weeks
	Viral purification and dialysis	1 week
	QC	4 weeks
	Total turnaround	10-13 weeks

Delivery Specifications:

The typical delivery consists of one ml of dialyzed and concentrated recombinant virus vectors and QC datasheet as shown below in the table.

QC Data	Adenoviral Vector	Adenoviral Vector	Lentiviral Vector	Retroviral Vector
Virus Concentration	10^8-10^{10} pfu/ml	10^8-10^9 pfu/ml	10^5-10^7 TU/ml	10^5-10^7 TU/ml
Virus Purity	$OD_{260/280}$ (1.2-1.4)	Commassie stained gel image(s)	$OD_{260/280}$ (1.2-1.4)	$OD_{260/280}$ (1.2-1.4)
Transgene Verification	qPCR	qPCR	qRT-PCR	qRT-PCR

Email: info@genscript.com Tel: 1-732-885-9188

Adenoviral Vector Services

(http://www.genscript.com/virus_av.html)

Service Specifications:

1. **Recombinant AV Vector Construction:** GenScript's AV vectors are standard E1- and E3-deleted AV vectors. Cloning plasmids are available to express the transgene as the single gene product or simultaneously with a GFP reporter under a bi-directional promoter for the purpose of transfection efficiency analysis.
2. **Recombinant AV Production:** A single plaque is selected and amplified by serial infection of 293A cells on 20×15 cm plates after transduction with the linearized vector plasmids. The yield of the purified recombinant AVs is usually 2-4 ml at a titer in the low to mid 10^{10} pfu/ml.
3. **Recombinant AV Characteristics:** Routinely, a single AV virus stock is prepared starting from 30×150 mm-cell culture dishes.
   a. Yield: 1×10^{3} viral particles/cell
   b. Biological titer: 10^{8}-10^{10} pfu/ml (concentrated)
   c. Final volume: 1 ml of purified viruses in phosphate buffered saline (PBS)

Reporter Vectors:

GenScript offers ready-to-use AAV-GFP and AAV-*Lac*Z reporter vectors that can be used as controls. Upon request, GenScript can produce customized AAV vectors pseudotyped with different capsid serotypes.

Adenoviral-Associated Viral Vector Services

(http://www.genscript.com/virus_aav.html)

Service Specifications:

1. **Recombinant AAV Vector Construction:** Cloning plasmids are available to express the transgene as single gene product or simultaneously with GFP reporter under control of IRES for transfection efficiency analysis.
2. **Recombinant AAV Production:** Recombinant AAV is generated in 293A cells by co-transfection with three plasmids, an AAV rep/cap expression plasmid, an adenovirus miniplasmid containing the required helper function, and the AAV viral vector plasmid.
3. **Recombinant AAV Preps:** Recombinant AAV particles are isolated from the transfected cell lysates either by heparin column chromatography (for AAV serotypes 2 and 5) or iodixanol density gradients (for all other serotypes). The final virus preps are dialyzed against PBS and titered by dot blot hybridization.
4. **Recombinant AAV Characteristics:** Routinely, a single recombinant AAV stock is prepared starting from 30×150 mm-cell culture dishes.
   a. Yield: 1×10^{3} viral particles/cell
   b. Biological titer: 10^{8}-10^{9} pfu/ml for concentrated
   c. Final volume: 1 ml of purified virus in phosphate buffered saline (PBS)

Reporter Vectors:

GenScript offers AAV-GFP and AAV-*Lac*Z vector preparations that can be used as controls. Upon request, GenScript can produce customized AAV vectors pseudotyped with different capsid serotypes.

Custom Viral Vector Services

Lentiviral Vector Services

(http://www.genscript.com/virus_lenti.html)

Service Specifications:

1. **Recombinant LV Construction:** GenScript uses a three-plasmid transient co-transfection of 293T cells to produce recombinant viral vectors: the helper-packaging construct, the envelope plasmid, and a lentiviral transfer vector. GenScript's recombinant lentiviral vectors carry your gene or siRNA upstream of the IRES-GFP reporter.
2. **Recombinant LV Production:** The transfected cells are incubated for 72 hours to allow LV particle production in the cell supernatants. The supernatants are then filtered and pelleted by sucrose gradient, and virus titer is estimated by FACS analysis on infected cells (for those expressing GFP) or by Southern blot.
3. **Recombinant LV Characteristics:** Routinely, a single rLV stock is prepared starting from 30×150 mm-cell culture dishes.
   - Yield: 1 ml of 10^{6}-10^{7} TU/ml recombinant virus stock (concentrated)

Reporter Vectors:

GenScript offers ready-to-use LV-GFP and LV-*Lac*Z reporter vectors that can be used as controls.

Retroviral Vector Services

(http://www.genscript.com/virus_retro.html)

Service Specifications:

1. **Recombinant Retroviral Vector Construction**
2. **Small-Scale Recombinant Virus Production:** GenScript will provide recombinant retrovirus yield from a 100 mm dish.
3. **Recombinant Retrovirus Titration:** GenScript will titrate recombinant retroviruses on NIH3T3 cells.
4. **Quality Control Assays:** Quantification of genome copies, quantification of retroviral vector infectivity.
5. **Replication-Competent Virus (RCV) Testing:** To rule out the possibility that replication-competent viruses were formed, every batch of recombinant retrovirus intended for use outside of biosafety level two lab is tested using HIV p24 ELISA and PCR assays.

Quotations and Ordering:

For quotation requests, or to order, please download and complete the GenScript's Viral Vector Order Form, and email or fax it to us. Orders can be placed with either a formal PO (Purchase Order) or credit card.

Order by email: order@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data

siRNA and miRNA Services

Vector-Based siRNA Services

(http://www.genscript.com/siRNA_interface.html)

GenScript's vector based siRNA services is an adaptation of GenScript's gene synthesis technology to the rise of RNAi (RNA interference) as a powerful tool for gene function analysis and drug target validation. The GenScript siRNA technology package includes siRNA design, siRNA vectors, and custom siRNA construction. GenScript siRNA technology has several advantages over synthetic siRNA methods: It produces highly reliable siRNA constructs at minimal cost, its products are more stable, and it frees scientists from the time-consuming and difficult task of siRNA vector construction.

GenScript's vector-based siRNA services also features a comprehensive collection of siRNA vectors, which are frequently cited in our customers' publications.

Applications:

- Establishment of stable and specific knockdown cell lines for phenotype studies
- Establishment of knock-out mouse lines using transgenic siRNA
- Studies on the effects of inducible promoters. See the full list of our vectors on page 72.
- Gene therapy using viral vectors
- Development of drugs using siRNA with chemical molecule mimicry

Key Features:

1. **Stronger Silencing Effect:** Vector-based siRNA inhibits gene expression more effectively than synthetic siRNA.
2. **Acclaimed siRNA Design Tools:** GenScript has developed advanced software tools to aid siRNA design. For a more personalized molecule, try our online design system:
   - **siRNA Target Finder:** This software identifies unique candidate siRNA target sequences in cDNA sequences.
   - **siRNA Construct Builder:** This software tool builds small hairpin inserts from siRNA targets, ideal for expression vectors.
   - **siRNA Sequence Scrambler:** This tool creates scrambled sequences as negative controls for siRNA experiments.
3. **Comprehensive siRNA Vector Collection:** GenScript offers siRNA vectors with various promoters, including U6, H1, CMV, enhanced U6 and H1, and inducible Tet-on. GenScript's siRNA vectors also come with several optional selection markers, including neomycin, hygromycin, puromycin, and zeomycin. GenScript's siRNA vectors are available in viral systems, including lentiviral, retroviral, and adenoviral systems. See the full list of our vectors on page 72.
4. **Pre-Designed siRNA Pool:** Our genome-wide pool of pre-designed siRNAs provides a wide selection of human and mouse constructs.
5. **Cost-Effective:** Unlike synthetic siRNA, GenScript's vector-based siRNA can be regenerated.

From design to delivery, choose superior siRNA.

Other Advantages:

1. **Easy to Handle:** GenScript's vector-based siRNA constructs are delivered ready-to-use. Unlike synthetic siRNA transfection, which requires special materials and handling, vector-based siRNA transfection uses routine transfection reagents.
2. **Inducible Systems:** Inducible vector-based siRNA systems allow controlled expression of siRNA. This is ideal for the study of genes that are lethal upon knockdown.
3. **Easy Transfection Analysis:** GenScript's cGFP siRNA vectors offer easy transfection efficiency analysis.
4. **Customized Vectors:** GenScript can deliver siRNA constructs in any commercially available destination vector for a reasonable fee.
5. **Easy Ordering:** Please download our detailed and informative order form or try our user-friendly online ordering system.

Delivery Specifications:

1. 4 µg of lyophilized siRNA vector plasmid DNA
2. Sequencing data for each clone

Pricing:

Cat. No.	Number of Constructs	Price per Construct
SC1007	1-2	$425.00 ($500.00 for Lentiviral Vector)

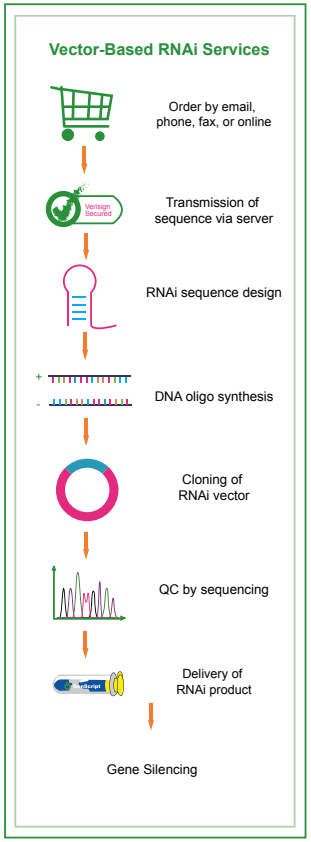
Note: Please contact GenScript for batch (≥ 3) order discounts.

- To optimize initial experiments, try siRNA positive controls from GenScript.
- Use a Maxiprep plasmid for transfection. GenScript offers both large-scale and low-endotoxin plasmid preparation services. For an additional $125.00, GenScript will include an order of Maxiprep plasmids (100 µg) with the siRNA orders.
- GenScript's vectors cost only $225.00-$350.00 per vector. These are one-time fees. The client will not be charged for selecting the same vector in the future.

Quotations and Ordering:

GenScript recommends that at least three vector-based siRNA constructs be prepared for each gene in order to identify a potent and specific siRNA. Orders can be placed through our regular or toll-free phone, email, fax, or online with a formal PO (Purchase Order) or credit card. We recommend our secure web server.

Orders can be placed by email (siRNA@genscript.com), phone (1-732-885-9188), or fax (1-732-210-0262) with a formal PO (Purchase Order) or credit card. We recommend that you submit your protein sequence via our secure web server.



siRNA and miRNA Services

Vector-Based miRNA Services

(http://www.genscript.com/miRNA_services.html)

MicroRNAs, or miRNAs, are endogenous, single-stranded RNA molecules of 18 to 22 nucleotides in length. They are believed to play a crucial role in eukaryotic development by controlling post-transcriptional gene expression. GenScript offers a vector-based miRNA construction service as a complement to its full spectrum of vector-based siRNA services.

Key Features:

1. **Competitive Prices:** Synthetic miRNA can be used up and must then be reordered. GenScript's vector-based siRNA can be regenerated on-site.
2. **Ready-to-Use Format:** GenScript's constructs are usable immediately without further subcloning or processing.
3. **Customized miRNA Vectors:** GenScript can deliver miRNA in any commercially available destination vector for a reasonable additional fee.
4. **Personalized Service:** For a more personalized molecule, try our online design system. It has been tested by GenScript and proven by our customers.
5. **Easy Ordering:** Please download our detailed and informative order form or try our user-friendly online ordering system (https://www.genscript.com/ssl-bin/order_miRNA).

Applications:

- Evaluation of miRNA regulatory roles
- Putative miRNA target sequence screening
- Creation of differential miRNA expression profiles for specific tissues and disease states

Services:

GenScript's unique vector-based miRNA technology comes with GenScript's vast experience in gene sequence construction. GenScript can, upon request, optimize and clone the miRNA-coding sequence into any of our miRNA cloning vectors. The resulting miRNA-expressing plasmid is delivered ready for transfection, and ideal for quantitative analysis using Northern blot, dot blot, RNase protection assays, primer extension analysis, invader assays, or quantitative PCR. The deliverables include miRNA plasmids, sequence data, and full QC documentation.

Pricing:

Cat. No.	Service	Price per Construct
SC1080	miRNA construction	$500.00

Ordering:

Orders can be placed in the way of ordering siRNA (Page 70).

GenScript siRNA and miRNA Vectors

(http://www.genscript.com/rnai_vector.html)

GenScript provides pure vector DNA amplified in bacterial cultures. GenScript's plasmid preparation service can produce vectors at any scale, from micrograms to large-scale industrial production including aliquoting and labeling.

GenScript Plasmid Expression Vectors:

GenScript's siRNA or miRNA vectors are designed for mammalian transfection. They use U6, H1, and CMV promoters to drive siRNA or miRNA expression. They can be ordered with neomycin, hygromycin, puromycin, or zeomycin resistance genes as selectable markers. These plasmids are well suited to the establishment of stable cell lines.

Cat. No.	Vector	Promoter	Resistance	Marker	Size	Price
SD1201	pRNA-U6.1/Neo	U6	Neomycin	-	10 μg	$225.00
SD1202	pRNA-U6.1/Hygro	U6	Hygromycin	-	10 μg	$225.00
SD1203	pRNA-H1.1/Neo	H1	Neomycin	-	10 μg	$225.00
SD1204	pRNA-H1.1/Hygro	H1	Hygromycin	-	10 μg	$225.00
SD1207	pRNA-U6.1/Zeo	U6	Zeomycin	-	10 μg	$225.00
SD1208	pRNA-H1.1/Zeo	H1	Zeomycin	-	10 μg	$225.00
SD1211	pRNAT-U6.1/Neo	U6	Neomycin	cGFP	10 μg	$350.00
SD1212	pRNAT-U6.1/Hygro	U6	Hygromycin	cGFP	10 μg	$350.00
SD1213	pRNAT-H1.1/Neo	H1	Neomycin	cGFP	10 μg	$350.00
SD1214	pRNAT-H1.1/Hygro	H1	Hygromycin	cGFP	10 μg	$350.00
SD1231	pRNA-CMV3.1/Neo	CMV3	Neomycin	-	10 μg	$225.00
SD1232	pRNA-CMV3.1/Hygro	CMV3	Hygromycin	-	10 μg	$225.00
SD1233	pRNA-CMV3.1/Puro	CMV3	Puromycin	-	10 μg	$225.00
SD1261	pRNAT-CMV3.1/Neo	CMV3	Neomycin	cGFP	10 μg	$350.00
SD1262	pRNAT-CMV3.1/ Hygro	CMV3	Hygromycin	cGFP	10 μg	$350.00
SD1263	pRNAT-CMV3.1/Puro	CMV3	Puromycin	cGFP	10 μg	$350.00
SD1264	pRNAT-CMV3.2/Neo	CMV3	Neomycin	cGFP	10 μg	$350.00
SD1265	pRNAT-CMV3.2/Hygro	CMV3	Hygromycin	cGFP	10 μg	$350.00
SD1266	pRNAT-CMV3.2/Puro	CMV3	Puromycin	cGFP	10 μg	$350.00
SD1550	pRNA-U6.3/Neo	U6 (enhanced)	Neomycin	-	10 μg	$225.00
SD1552	pRNA-H1.3/Neo	H1 (enhanced)	Neomycin	-	10 μg	$225.00
SD1561	pRNAT-U6.3/Hygro	U6 (enhanced)	Hygromycin	cGFP	10 μg	$350.00
SD1563	pRNAT-H1.3/Hygro	H1 (enhanced)	Hygromycin	cGFP	10 μg	$350.00

siRNA and miRNA Services

Inducible Expression Vectors:

The Tet-on inducible system is also available in adenoviral, retroviral, and lentiviral expression vectors (see below).

Cat. No.	Vector	Promoter	Resistance	Marker	Size	Price
SD1223	pRNATin-H1.2/Neo	H1 (inducible)	Neomycin	cGFP	10 µg	$350.00
SD1224	pRNATin-H1.2/Hygro	H1 (inducible)	Hygromycin	cGFP	10 µg	$350.00
SD1220	pRNAin-H1.2/Neo	H1 (inducible)	Neomycin	-	10 µg	$350.00
SD1229	pRNATin-H1.2/Adeno	H1 (inducible)	-	cGFP	10 µg	$350.00
SD1234	pRNAin-H1.2/Shuttle	H1 (inducible)	Neomycin	-	10 µg	$350.00
SD1254	pRNATin-H1.4/Retro	H1 (inducible)	Hygromycin	cGFP	10 µg	$350.00
SD1260	pRNATin-H1.4/Lenti	H1 (inducible)	Neomycin	cGFP	10 µg	$350.00

Viral Expression Vectors:

- GenScript's adenoviral vectors are compatible with the Clontech Adeno-X™ Expression System and the Stratagene AdEasy™ Adenoviral Vector System.
- GenScript's retroviral siRNA expression vectors are compatible with the Retro-X Expression System.
- GenScript's lentiviral vectors are compatible with the ViraPower™ Lentiviral Expression System.

Adenoviral Shuttle Vectors:

Cat. No.	Vector	Promoter	Resistance	Marker	Size	Price
SD1205	pRNA-U6.1/Shuttle	U6	Neomycin	-	10 µg	$225.00
SD1206	pRNA-H1.1/Shuttle	H1	Neomycin	-	10 µg	$225.00
SD1216	pRNAT-H1.1/Shuttle	H1	Neomycin	cGFP	10 µg	$350.00
SD1234	pRNAin-H1.2/Shuttle	H1 (inducible)	Neomycin	-	10 µg	$350.00
SD1209	pRNA-H1.1/Adeno	H1	-	-	10 µg	$225.00
SD1219	pRNAT-H1.1/Adeno	H1	-	cGFP	10 µg	$350.00
SD1229	pRNATin-H1.2/Adeno	H1 (inducible)	-	cGFP	10 µg	$350.00

Lentiviral Expression Vectors:

Cat. No.	Vector	Promoter	Resistance	Marker	Size	Price
SD1259	pRNAT-U6.2/Lenti	U6	Neomycin	cGFP	10 µg	$350.00
SD1260	pRNATin-H1.4/Lenti	H1 (inducible)	Neomycin	cGFP	10 µg	$350.00

Retroviral Expression Vectors:

Cat. No.	Vector	Promoter	Resistance	Marker	Size	Price
SD1241	pRNA-H1.1/Retro	H1	Hygromycin	-	10 µg	$225.00
SD1253	pRNAT-H1.4/Retro	H1	Hygromycin	cGFP	10 µg	$350.00
SD1254	pRNATin-H1.4/Retro	H1 (inducible)	Hygromycin	cGFP	10 µg	$350.00

siRNA Positive Controls:

Firefly Luciferase siRNA Constructs: siFLuc

siFLuc positive controls are siRNA constructs designed to knock down firefly luciferase. The target sequence (CTTACGCTGAGTACTTCGA) (Nat. Genet. 2002, 32:107) is designed to silence firefly luciferase expressed by a cotransfected PgL3-control vector. The silencing efficiency of siFLuc siRNA is about 80%.

Cat. No.	Vector	Promoter	Resistance	Marker	Size	Price
SD1501	pRNA-U6.1/Neo/siFLuc	U6	Neomycin	–	10 µg	$225.00
SD1502	pRNA-U6.1/Hygro/siFLuc	U6	Hygromycin	–	10 µg	$225.00
SD1503	pRNA-H1.1/Neo/siFLuc	H1	Neomycin	–	10 µg	$225.00
SD1504	pRNA-H1.1/Hygro/siFLuc	H1	Hygromycin	–	10 µg	$225.00
SD1531	pRNA-CMV3.1/Neo/siFLuc	CMV3	Neomycin	–	10 µg	$225.00
SD1532	pRNA-CMV3.1/Hygro/siFLuc	CMV3	Hygromycin	–	10 µg	$225.00
SD1512	pRNAT-U6.1/Hygro/siFLuc	U6	Hygromycin	cGFP	10 µg	$225.00
SD1551	pRNA-U6.3/Neo/siFLuc	U6 (enhanced)	Neomycin	–	10 µg	$225.00
SD1553	pRNA-H1.3/Neo/siFLuc	H1 (enhanced)	Neomycin	–	10 µg	$225.00
SD1523	pRNATin-H1.2/Neo/siFLuc	H1 (inducible)	Neomycin	cGFP	10 µg	$225.00
SD1565	pRNAT-U6.3/Hygro/siFLuc	U6 (enhanced)	Hygromycin	cGFP	10 µg	$350.00
SD1566	pRNAT-H1.3/Hygro/siFLuc	H1 (enhanced)	Hygromycin	cGFP	10 µg	$350.00
SD0226	pRNA-Luc/Neo	SV40	Neomycin	–	10 µg	$350.00

Renilla Luciferase siRNA Constructs: siRLuc

siRLuc positive controls are siRNA constructs designed to knock down Renilla luciferase. The target sequence (GTAGCGCGGTGTATTATAC) (Nat. Biotechnol. 2002, 20:497) of siRLuc is designed to silence Renilla luciferase expressed by a co-transfected pRL-TK vector. The silencing efficiency of siRLuc is about 80%.

Cat. No.	Vector	Promoter	Resistance	Marker	Size	Price
SD1601	pRNA-U6.1/Neo/siRLuc	U6	Neomycin	–	10 µg	$225.00
SD1602	pRNA-U6.1/Hygro/siRLuc	U6	Hygromycin	–	10 µg	$225.00
SD1603	pRNA-H1.1/Neo/siRLuc	H1	Neomycin	–	10 µg	$225.00
SD1604	pRNA-H1.1/Hygro/siRLuc	H1	Hygromycin	–	10 µg	$225.00

cGFP (Coral Green Fluorescent Protein) siRNA Constructs: si-cGFP

GenScript's si-cGFP controls are siRNA constructs designed to knock down cGFP expression. The si-cGFP controls allow scientists to study the effects of siRNA by monitoring cGFP fluorescence using fluorescence microscopy. The si-cGFP sequence is cloned in pRNA-U6.1/Neo and pRNA-H1.1/Neo vectors. Thus, they can be used to test the effects of U6 and H1 promoters.

Cat. No.	Vector	Promoter	Resistance	Marker	Size	Price
SD1701	pRNA-U6.1/Neo/sicGFP	U6	Neomycin	–	10 µg	$225.00
SD1702	pRNA-H1.1/Hygro/sicGFP	H1	Hygromycin	–	10 µg	$225.00

siRNA Negative Controls:

siRNA negative controls can be designed with the GenScript's siRNA Scrambler Tool. Its siRNA products have the same nucleotide composition as the target sequence but no homology to any of the mRNA sequences in the NCBI Refseq database. GenScript also provides a general-purpose negative control. Its 21-mer sense sequence has a GC content of 48% and shows no homology to any of the human, mouse, or rat mRNA sequences in the NCBI Refseq database.

Cat. No.	Vector	Promoter	Resistance	Marker	Size	Price
SD1801	pRNA-U6.1/Neo/CTL	U6	Neomycin	–	10 µg	$225.00
SD1802	pRNA-H1.1/Neo/CTL	H1	Neomycin	–	10 µg	$225.00
SD1831	pRNA-CMV3.1/Neo/CTL	CMV3	Neomycin	–	10 µg	$225.00

Note: Empty vectors may not make good negative controls because they do not have proper termination signals downstream of the H1 or U6 promoters.

Note: GenScript offers advanced products and services to monitor gene expression, including a series of One-Step Western™ kits that cut the time required to run a Western blot to 1 hour. Our One-Step Western™ Multiplex Kits allow simultaneous detection of your protein and one of the housekeeping genes for efficient quantitation. Our collection of catalog antibodies includes full sets of pan and phospho-specific antibodies for thirteen signaling pathways. Visit www.genscript.com for further information.

Selected Publications:

- David *et al.* Genes & Development. May 2007; 21(10): 1231-1243.
- Hellebrekers *et al.* Cancer Res. May 2007; 67(9): 4138-4148.
- Lay *et al.* Cancer Res. Apr 2007; 67(8): 3878-3887.
- Lin *et al.* J. Virol. Jun 2007; 81(11): 5705-5713.
- Al-Sadi and Ma. J. Immunol. Mar 2007; 178: 4641-4649.
- Huang *et al.* J. Neurosci. Jan 2007; 27(3): 449-458.
- Chan *et al.* Stem Cells. Feb 2007; 25(2): 529-536.
- Kondo *et al.* J. Cell Sci. Mar 2007; 120(5): 849-857.
- Pannu *et al.* J. Biol. Chem. Apr 2007; 282(14): 10405-10413.
- Siner *et al.* FASEB J. May 2007; 21(7): 1422-1432.
- Little *et al.* J. Biol. Chem. Mar 2007; 282(10): 7219-7231.
- Kanda *et al.* J. Virol. Jan 2007; 81(2): 669-676.
- Devoogdt *et al.* J. Immunol. Dec 2006; 177(11): 8046-8052.
- Adiseshaiah *et al.* J. Immunol. Nov 2006; 177(10): 7193-7202.
- Nouspikel *et al.* Mol. Cell. Biol. Dec 2006; 26(23): 8722-8730.
- Saleem *et al.* Proc. Natl. Acad. Sci. USA. Oct 2006; 103(40): 14825-14830.
- Wang *et al.* Clinical Cancer Research. Aug 2006; 12(16): 4965-4973.
- Kanekura *et al.* J. Biol. Chem. Oct 2006; 281(40): 30223-30233.
- Rahnama *et al.* Endocrinology. Nov 2006; 147(11): 5275-5283.
- Lilienfeld *et al.* J. Immunol. Aug 2006; 177(4): 2146-2152.

Custom Tissue Array and Tissue Block Service

(http://www.genscript.com/tissue_array.html)

Tissue arrays (also called tissue microarray, or TMA) are one of the best high-throughput methods for simultaneous histological analysis of multiple tissues. Tissue arrays are particularly useful for evaluating biomarkers in clinical studies such as molecular diagnostics in cancer research, in which meaningful size of cancer tissues with matched tissue samples and availability of detailed medical information may be limited.

GenScript offers tissue array and tissue block services for biomarker investigation, providing solutions for tissue collection, tissue paraffin block manufacturing, and tissue array production and analysis. GenScript can quickly identify patient populations for tissue collection and rapidly transform research hypotheses into clinical biomarkers and disease management strategies.

GenScript offers trial slides from pre-made tissue arrays, available with a reasonable fee.

Key Features:

- Large Network for Tissue Collection
- Wide Variety of Tissue Types
- High Tissue Core Density
- Premium Array Quality
- Precise Pathology Diagnosis
- Very Competitive Prices
- Flexible Purchase Options

Services and Delivery Specifications:

Cat. No.	Services	Delivery Specifications
SC1186	Customized Tissue Collection and Tissue Paraffin Block Preparation Services	• Customized tissue paraffin blocks • Relevant clinical data and pathology diagnostic data • QC reports
SC1187	DNA, RNA and Protein Preparation from Frozen Tissue	• DNA, RNA, or protein from each sample • Relevant clinical data and pathology diagnostic data • QC reports
SC1188	Tissue Array Production Using Clients' Tissue Blocks	• Customized tissue arrays • Images of H&E stained sample arrays • QC reports
SC1189	Tissue Array Production Using Pre-Made Tissue Blocks from GenScript	• Customized tissue arrays • Relevant clinical data and pathology diagnostic data • Images of H&E stained sample arrays • QC reports
SC1190	Tissue Array Analysis and Data Processing Services	• Relevant images and analytical results • Relevant clinical data and pathological diagnostic data • QC reports

Sample Submission Requirements:

GenScript accepts only tissue paraffin blocks from clients. Please download and complete GenScript Tissue Submission Form, send it to tissuearray@genscript.com with the detailed contact information requested in the form. Tissue blocks should be submitted along with a hard copy of the Tissue Submission Form to Tissue Array Services, GenScript USA Inc., 120 Centennial Ave., Piscataway, NJ 08854, US.

Tissue Array Services

I. Customized Tissue Collection and Tissue Paraffin Block Preparation

GenScript has established a sophisticated and integrated tissue collection network in compliance with FDA GLP guidelines to collect diseased and normal tissues for individual research requirements. Our one-stop service covers clinical data collection, tissue sample registration, tissue collection, transportation, storage, processing, paraffin embedding, pathological identification and validation, and tissue database management.

GenScript tissue collection strictly follows the approved ethical guidelines ensuring the confidentiality and safety of patient information. All tissues to be collected are waived of intellectual property right and ownership right by tissue donors. Our clinical annotations for the tissues include date of initial diagnosis, medical history, and therapy history.

SC1186: Customized Tissue Collection and Tissue Paraffin Block Preparation Services

The standard procedure for clinical histological analysis is used in our paraffin block preparation, in which tissues are infused with melted paraffin and embedded in a square mold, suitable for microtome sectioning and array production. The histopathological data of each tissue specimen is independently reviewed and mapped by two certified histo-pathologists. GenScript delivers tissue paraffin blocks with full clinical information and QC reports.

SC1187: DNA, RNA and Protein Preparation from Frozen Tissues

GenScript offers service for DNA, RNA, and protein extraction from frozen tissue collections. Extracted DNA, RNA and proteins can be used for PCR, RT-PCR, DNA microarray hybridization, 2-D gels, and proteomics.

II. Customized Tissue Array Production

SC1188: Tissue Array Production Using Tissue Blocks from Clients

GenScript recommends that the tissue specimens are fixed in freshly prepared 10% formalin in phosphate buffer. GenScript provides downstream services that cover entire tissue array production process, including paraffin embedding, sectioning, staining, histopathological evaluation, array design, and diagnosis. The tissue array panels and formats will be designed according to customers' requirements. Every 10th array will be H&E stained and evaluated by histopathologists.

SC1189: Tissue Array Production Using Pre-Made Tissue Blocks from GenScript

GenScript also provides customized tissue array services using its pre-made tissue blocks following the same processing and QC procedures as described above.

III. SC1190: Tissue Array Analysis and Data Processing

GenScript offers array analysis and data processing services for both tissue arrays produced at GenScript and those provided by clients. Our tissue array analysis services include the following:

- H&E staining
- Immunohistochemistry (IHC) staining
- *In situ* hybridization (ISH)
- Fluorescent *in situ* hybridization (FISH)
- *In situ* PCR and RT-PCR
- Primed *in situ* labeling (PRINS)
- Spot-to-spot data analysis
- Data and image processing

Pre-Made Tissue Paraffin Blocks and Tissue Arrays

(http://www.genscript.com/product_of_tissue_array_and_tissue_block.html)

1. Pre-Made Tissue Paraffin Blocks

GenScript provides formalin-fixed and paraffin embedded (FFPE) tissue blocks, each with full clinical information. The tissues can be analyzed by *in situ* hybridization (ISH) and immunohistochemical (IHC) staining. The tissues are processed within 24 hours after fixation to ensure the preservation of intact, retrievable mRNA and antigens.

2. Pre-Made Tissue Arrays

GenScript offers tissue arrays with up to 500 cores per slide. Each slide may contain diseased, marginal, and normal tissue cores. All pre-made and customized slides come with their own unique codes and are accompanied by scanned images and relevant clinical information.

Quotations and Ordering:

For quotation requests, consultations, estimates, and questions, please contact us by email, phone, or fax. For quotation, please also download and complete our Tissue Array Quotation/Order Form, and send it to us by email or via secure web server.

Orders may be placed by email, phone, fax with either a formal PO (Purchase Order) or credit card. Our customer service representatives are available 24 hours, Monday through Friday to assist you.

If submitting tissue paraffin blocks, please include hard copies of completed Tissue Submission Form and completed Quotation/Order Form, send in one package to Tissue Array Service, GenScript USA Inc., 120 Centennial Ave., Piscataway, NJ 08854, US.

Order by email: tissuearray@genscript.com

Order by phone: 1-877-436-7274 (Toll-Free) 1-732-885-9188

Order by fax: 1-732-210-0262 1-732-885-5878

Secure web server (Encrypted): https://www.genscript.com/ssl-bin/secure_data