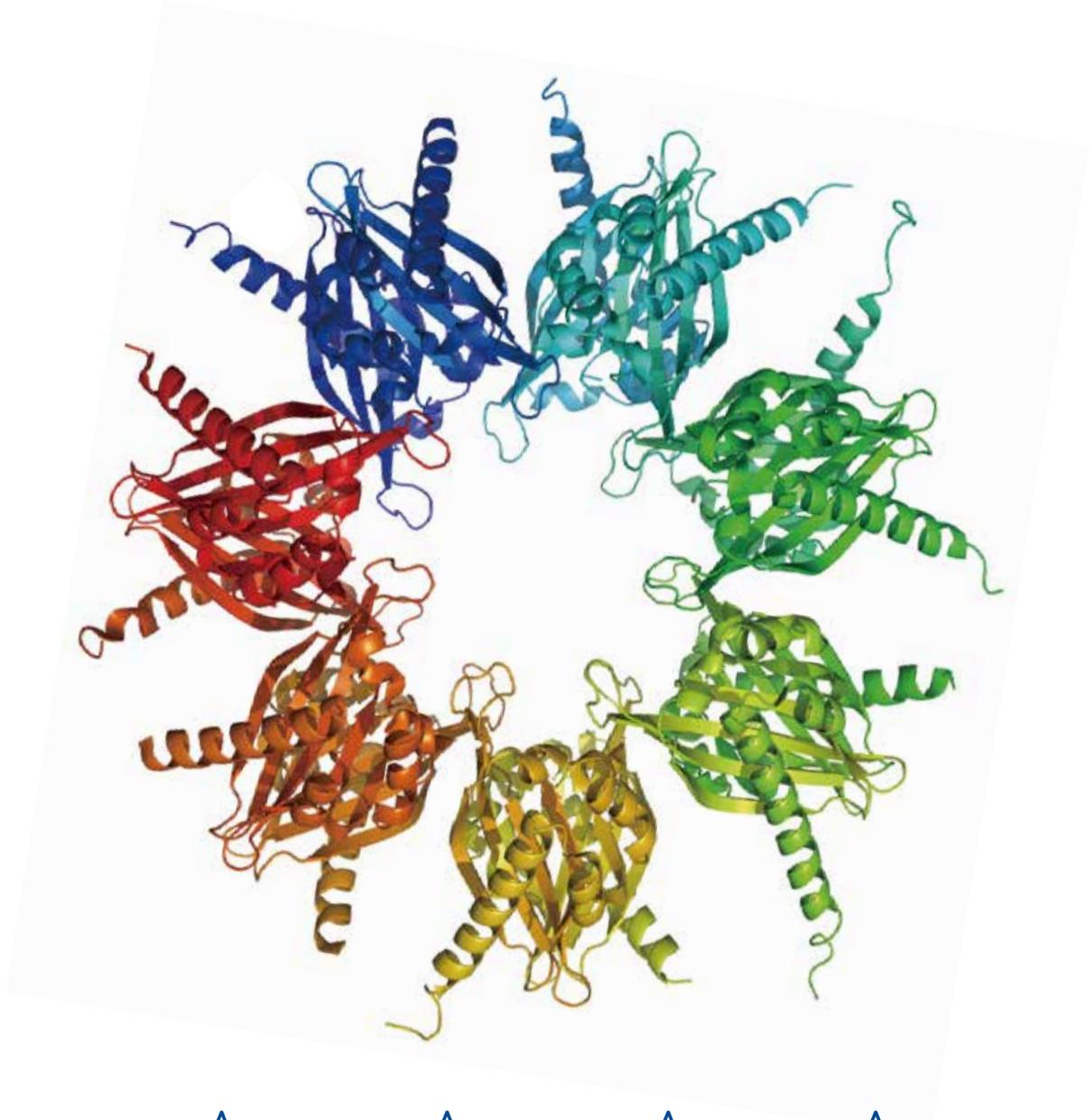


# Recombinant Protein Expression Services



Bacterial



Mammalian



Insect



Yeast



**Who we are:** GenScript is a leading Contract Research Organization [CRO] and protein research partner for fundamental life science research, translational biomedical research, and early stage pharmaceutical development. GenScript has built the best-in-class capacity and capability for biological research services encompassing gene synthesis and molecular biology, peptide synthesis, custom antibodies, protein expression, antibody and protein engineering, and *in vitro* and *in vivo* pharmacology.

**Our track record:** Successful track record of delivering high quality proteins.

**6,000+**

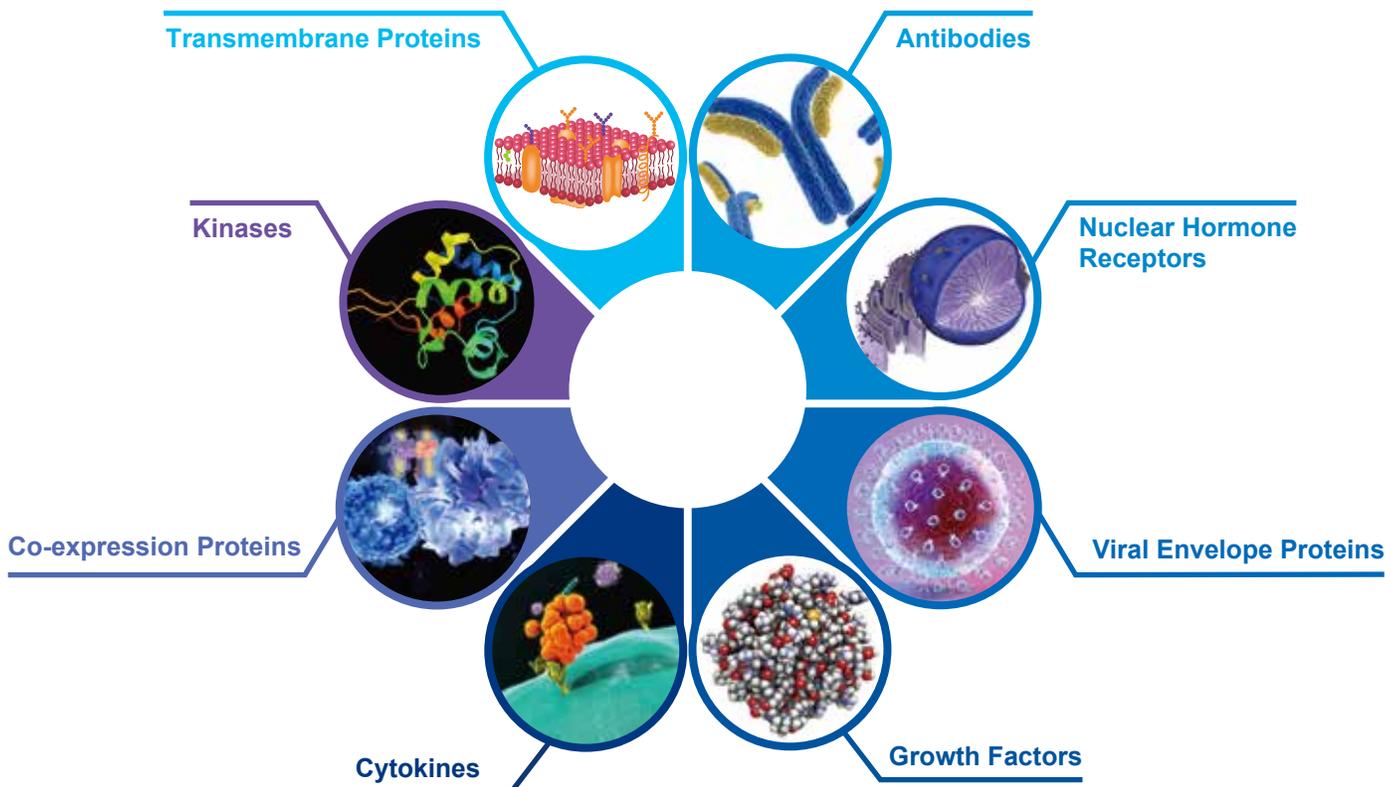
High quality Protein orders delivered

**>92%**

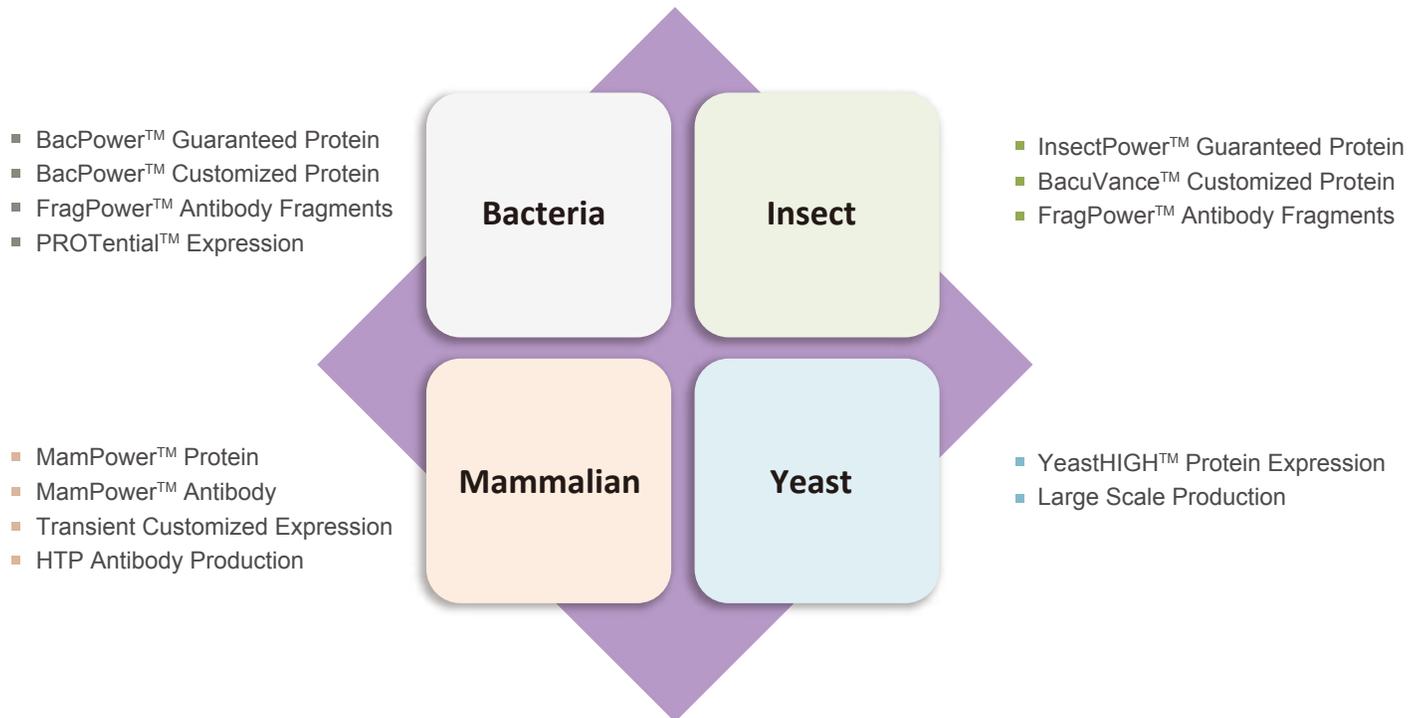
Success rate for all Protein projects

**1,500+**

High quality Recombinant Antibody orders delivered

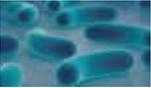


## High quality recombinant proteins produced in a choice of four expression systems



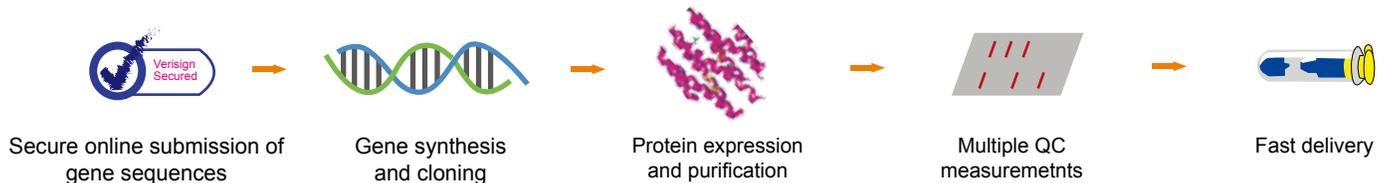
The GenScript logo resembles a drop of water and symbolizes the source of life. It inspires our dedication to evolve with our customers and push the limits of technology to save more lives by providing early drug discovery and development services. Founded in 2002, GenScript has grown together with the synthetic biology industry and is now the world's largest gene synthesis supplier. Headquartered in New Jersey with subsidiaries in Europe, Japan, and China, GenScript consistently provides the best research services to the scientific community worldwide. Built on our assembly-line mode, one-stop solutions, continuous improvement, and stringent IP protection, GenScript provides a comprehensive portfolio of services. Besides our world-renowned gene synthesis service, GenScript offers comprehensive services for biological research and early-phase drug discovery, such as agricultural research, food industry research, assay development & screening, antibody drug development and research, and animal model services. With an impressive track record of success, GenScript is your ideal, reliable innovation partner in advancing and transforming biology research to make your research easy.

## Expression System Selection Guide

Expression System	Advantages	Disadvantages	Protein Application Examples
 Bacteria	<ul style="list-style-type: none"> <li>• Relatively inexpensive</li> <li>• Simple genetics</li> <li>• Easy to manipulate</li> <li>• Easy scale up</li> <li>• Fast expression</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of efficient post-translational modifications</li> <li>• Codon usage issues</li> <li>• Inclusion bodies</li> <li>• Low yield and activity for some eukaryotic proteins</li> <li>• Difficult to express higher molecular weight proteins</li> </ul>	<ul style="list-style-type: none"> <li>• Antigen</li> <li>• Biochemical analyses</li> <li>• Diagnostic studies</li> <li>• Drug discovery &amp; validation</li> <li>• Functional assays</li> <li>• Protein-protein interactions</li> <li>• Structural biology</li> <li>• Therapeutic protein</li> </ul>
 Mammalian	<ul style="list-style-type: none"> <li>• Comprehensive post-translational modifications</li> <li>• Excellent method for the production of bioactive proteins</li> </ul>	<ul style="list-style-type: none"> <li>• Long production time</li> <li>• High media costs</li> <li>• Protein yields relatively lower</li> </ul>	
 Insect	<ul style="list-style-type: none"> <li>• Good secretion</li> <li>• Post translational modifications resemble mammalian system</li> <li>• Suitable for toxic gene products</li> </ul>	<ul style="list-style-type: none"> <li>• Long production time</li> <li>• Relatively high media costs</li> </ul>	
 Yeast	<ul style="list-style-type: none"> <li>• Diverse post-translational modifications</li> <li>• Low cost of culture media</li> <li>• Industry-scale fermentation</li> </ul>	<ul style="list-style-type: none"> <li>• Improper glycosylation</li> <li>• Excessive glycosylation</li> </ul>	

## Standard Workflow

### Protein Expression & Purification Streamlined Services



## Small Scale Expression Evaluation & Optimization

### PROtential™ Protein Expression Evaluation & Optimization

- Evaluate whether your target protein expresses in your chosen expression system
- Identify the construct and conditions that gives you the most robust soluble expression of your target protein
- Identify the best expression system for your target protein

PROtential™ Protein Expression Evaluation & Optimization					
Name	Service Type	Expression	Price*	Timeline weeks	Description
Standard	Protein Expression Evaluation	<i>E. coli</i> (SC1653-B)	Starting from \$280	1-2	<ul style="list-style-type: none"> <li>• Test 1 condition for soluble expression in a customer chosen bacterial strain</li> </ul>
		Insect (SC1653-I)	Starting from \$400	3-4	<ul style="list-style-type: none"> <li>• Test 1 condition for soluble expression in Sf9, Sf21, S2 or Hi-5 cells</li> </ul>
		Mammalian (SC1653-M)	Starting from \$500	3-4	<ul style="list-style-type: none"> <li>• Test 1 condition for soluble expression in CHO or HEK 293 cells</li> </ul>
		All 3 Systems (SC1653-3S)	Starting from \$950	3-4	<ul style="list-style-type: none"> <li>• Test soluble expression 1 condition/expression system (<i>E.coli</i>, Insect, Mammalian); total 3 systems</li> </ul>
Silver	Protein Expression Optimization	<i>E. coli</i> (SC1667)	By Quote	2-3	<ul style="list-style-type: none"> <li>• Test 8 different conditions</li> <li>• Optimize growth temperature, media components &amp; inducer concentrations</li> <li>• Identify the best expression condition with your chosen vector and bacterial strain</li> </ul>
Gold	Protein Expression Optimization	<i>E. coli</i> (SC1668)	By Quote	4-8	<ul style="list-style-type: none"> <li>• Test 48 different conditions</li> <li>• Optimize growth temperatures, media components, inducer concentrations, promoters, host cell strains &amp; fusion partners</li> <li>• Robust, industry-first, high-throughput expression and solubility optimization matrix</li> </ul>

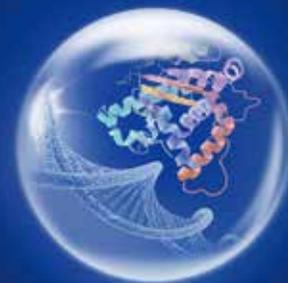
### Deliverables Include

- Comprehensive expression data report with solubility information
- The best expression condition/matrix among tested (Silver & Gold packages only)
- Optimized construct (Gold package only)

#### Why use this service?

PROtential™ allows you to seamlessly integrate protein expression along with your gene synthesis order to eliminate protein expression uncertainties and identify the best expression system for your target protein

Eliminate the guesswork from protein production



## Bacterial Expression Services

BacPower™ Guaranteed Bacterial Protein Expression							
Tag	Purity	Catalog Number	Length	Price (3mg)	Additional protein (up to 10mg )	Timeline (weeks)	Endotoxin Level Option
Small tag	85%	SC1253-85T-500	≤500 amino acids	starting from \$1600	\$100/mg	4	≤1.0EU/ug ≤0.1EU/ug ≤0.01EU/ug
		SC1253-85T-800	>500 amino acids and ≤800 amino acids	\$1920	\$120/mg	5	
	90%	SC1253-90T-500	≤500 amino acids	\$1800	\$115/mg	5	
		SC1253-90T-800	>500 amino acids and ≤800 amino acids	\$2200	\$140/mg	6	

### Why use BacPower™ Guaranteed Services?

Zero-risk and best value packages that can be used for most target proteins under 100 kDa. Hassle-free service and lots of options to choose from—We recommend this service if you are doing immunology research, antibody drug discovery, or recombinant vaccine development.

BacPower™ Customized Bacterial Protein Expression			
Expression Package	Customer Provides	Deliverables	Delivery Time
BacPower Customized Bacterial Protein Expression (SC1318)	Target sequence (DNA or protein)/DNA template/expression construct	Pure, recombinant protein as specified by the customer	Depending on project complexity, it can be as short as 6 weeks

### Why use BacPower™ Customized Services?

Best for higher difficulty targets like membrane proteins, toxins, ion channel proteins, etc. Also, ideal if you have unique experimental requirements [example – special protocols, your own recommendations, your DNA samples instead of gene synthesis etc.]

FragPower™ Guaranteed Antibody Fragments							
Customer Provides	Catalog Number	Fragments	System	Price*	Timeline (weeks)	Purity Options	Deliverables
Target fragment amino acid sequence	SC1685	scFv	<i>E. coli</i>	starting from \$2,399	7	≥90%	<ul style="list-style-type: none"> <li>Antibody Fragment in buffered solution with the specified amount &amp; purity – Guaranteed</li> <li>Optimized gene sequence report</li> <li>QC data</li> </ul>
	SC1688	V <sub>H</sub> /V <sub>H</sub>	<i>E. coli</i>	\$2,399			
	SC1686	Fab	Insect	\$3,399	10		

### Why use FragPower™ Guaranteed Antibody Fragment Services?

Excellent alternative to full length recombinant antibodies for research and diagnostic applications that require full antigen-binding capacity

# Mammalian Expression Services

Mammalian Transient Expression					
Target Type	Expression Package	Description	Timeline (weeks)	Price*	When to Use this Service
Recombinant Antibody (rAb)	High Throughput Antibody Production (SC1796, SC1797)	<ul style="list-style-type: none"> <li>Begins with either codon optimization and gene synthesis or customer-supplied DNA.</li> <li>Deliverables include affinity purified rAb, report &amp; QC data.</li> </ul>	6	Starting from \$499/per antibody	<ul style="list-style-type: none"> <li>Ideal for Ab drug screening purposes.</li> <li>For rAb production of samples 8 and up, up to 1 mg.</li> </ul>
	MamPower™ mammalian rAb expression (SC1259A)	<ul style="list-style-type: none"> <li>Starts with codon optimization &amp; gene synthesis.</li> <li>Guaranteed service.</li> <li>Deliverables include synthetic genes, optimized gene sequence report, rAb, and QC data.</li> </ul>	5+	Starting from \$2,999	<ul style="list-style-type: none"> <li>Ideal for candidate validation.</li> </ul>
	Large scale rAb production (SC1673, SC1675)	<ul style="list-style-type: none"> <li>Begins with codon optimization &amp; gene synthesis.</li> <li>Guaranteed service.</li> <li>Deliverables include purified rAb, report, QC data.</li> </ul>	9-12	Inquire	<ul style="list-style-type: none"> <li>For large scale rAb production up to 5g at ≥99% purity.</li> <li>Ideal for candidate validation and <i>in vitro</i> and <i>in vivo</i> studies.</li> </ul>
Protein	MamPower™ mammalian protein expression (SC1259P)	<ul style="list-style-type: none"> <li>Begins with codon optimization &amp; gene synthesis.</li> <li>Guaranteed service.</li> <li>Deliverables include synthetic gene, target protein, QC data, and final report.</li> </ul>	9-11	Starting from \$4,999	<ul style="list-style-type: none"> <li>For transient expression of secreted proteins and extracellular domains of membrane proteins.</li> </ul>
	Semi-customizable protein expression (SC1910)	<ul style="list-style-type: none"> <li>Begins with codon optimization and gene synthesis or customer's expression construct.</li> <li>Flexible scale customizable service.</li> <li>Deliverables include synthetic gene (optional), expression report, and purified protein.</li> </ul>	5+	Starting from \$1,999	<ul style="list-style-type: none"> <li>For transient expression of secreted proteins.</li> </ul>
Recombinant Antibody/Protein	HD Transient Expression (SC1806, SC1807)	<ul style="list-style-type: none"> <li>Begins with either codon optimization and gene synthesis or customer-supplied DNA.</li> <li>Deliverables include synthetic gene in pUC57, expression report, purified protein (if requested), and QC data.</li> </ul>	10-12	Inquire	<ul style="list-style-type: none"> <li>When your protein/rAb is a low expresser and you would like to enhance expression.</li> </ul>
	Fully customizable protein and rAb expression services (SC1482)	<ul style="list-style-type: none"> <li>Fully customizable expression service to meet your individual requirements.</li> </ul>	Project-dependent	Inquire	<ul style="list-style-type: none"> <li>When you have a very customized project or when your project does not fit in any of the other service categories.</li> </ul>

Mammalian Stable Expression					
Expression Package	Customer Provides	Steps	Timeline (weeks)	Deliverables	Description
Stable bioproduction cell line (SC1503)		Gene synthesis & subcloning (optional)	4	Target gene(s) in pUC57 & vector map	<ul style="list-style-type: none"> <li>Codon-optimization &amp; gene synthesis</li> <li>Subcloning into mammalian cell expression vector</li> <li>Plasmid maxiprep for mammalian expression</li> </ul>
		Transient expression evaluation	2-3	Expression report	<ul style="list-style-type: none"> <li>Transfect cells with expression constructs using small scale expression system</li> <li>Detect expression levels by ELISA and/or WB</li> </ul>
Advanced bioproduction cell line (SC1557)	Target sequence (DNA or protein), DNA template, or Expression construct	Stable cell line development	21-26	Top 3 stable clones (5 clones in case of SC1557)	<ul style="list-style-type: none"> <li>Stable transfection and screening single cell clones</li> <li>MTX amplification and screening</li> <li>Subcloning of top 3 clones</li> <li>Screening subclones with highest productivity</li> <li>Stability test for 10 passages</li> <li>Batch culture to evaluate final expression</li> <li>Research cell bank preparation</li> </ul>
Guaranteed Gram level stable cell line <sup>#</sup> (SC1709)		Process development	8-10	Comprehensive report	<ul style="list-style-type: none"> <li>Medium selection</li> <li>Fed-batch process development</li> <li>Physical compatibility experiment</li> <li>Feed supplementation test</li> </ul>

<sup>#</sup> Uses a Glutamine Synthetase expression system for which time line is faster since gene amplification is not required.

## Insect Expression Services

Harness the superior power of insect cell expression using our InsectPower™ and BacuVance™ proprietary technologies. Get higher quality protein with improved solubility and the desired post-translational modifications. Also suitable for expression of cell-toxic products.

InsectPower™ Guaranteed Insect Expression					
Expression Package	Customer Provides	Timeline (weeks)	Price*	Deliverables	
InsectPower™ Guaranteed Service (SC1810)	Target protein sequence	12-15	Starting from \$3,950	<ul style="list-style-type: none"> <li>1 mg tagged protein</li> <li>COA report</li> </ul>	

BacuVance™ Customized Insect Expression					
Expression Package	Customer Provides	Steps	Timeline (weeks)	Deliverables	Description
BacuVance™ custom insect expression (SC1810)	Target sequence, DNA template, or Expression construct	Gene synthesis & subcloning (optional)	2	<ul style="list-style-type: none"> <li>Construct report</li> </ul>	<ul style="list-style-type: none"> <li>Subcloning into one or more expression vectors</li> </ul>
		Virus generation	2-3	<ul style="list-style-type: none"> <li>5 ml, <math>\geq 10^7</math> pfu/ml virus stock</li> </ul>	<ul style="list-style-type: none"> <li>Generation of recombinant Bacmid DNA</li> <li>Transfection of insect cell with recombinant Bacmid DNA</li> <li>Generation of P1 stock (Low titer), P2 stock (High titer), and determination of virus titer by Quantitative-PCR</li> <li>Verify the protein expression for P1 and P2 generation by western blot with anti-His/GST or other antibody</li> </ul>
		Pilot expression & purification evaluation	1-2	<ul style="list-style-type: none"> <li>Comprehensive report</li> </ul>	<ul style="list-style-type: none"> <li>Infection of insect cells with P2 stock</li> <li>One-step affinity purification</li> <li>SDS-PAGE gel and Western blot</li> </ul>
		Process development	1-2	<ul style="list-style-type: none"> <li>Purified proteins</li> <li>QC data</li> </ul>	<ul style="list-style-type: none"> <li>1 L insect cell expression and purification</li> <li>One-step purification</li> <li>QC by SDS-PAGE &amp; Western blot</li> </ul>

## Yeast Expression Services

YeastHIGH™ Standard Yeast Expression						
Expression Package	Customer Provides	Steps	Timeline (weeks)	Deliverables	Description	Price*
Yeast HIGH (SC1257)	Target sequence/DNA template/ expression construct	Gene synthesis & subcloning (optional)	2	<ul style="list-style-type: none"> <li>Construct report</li> </ul>	<ul style="list-style-type: none"> <li>Subcloning into appropriate expression vector</li> <li>Plasmid maxi preparation</li> <li>Construct linearization</li> </ul>	Starting at \$2,900
		Expression & evaluation	2	<ul style="list-style-type: none"> <li>Expression data</li> </ul>	<ul style="list-style-type: none"> <li>Transformation of linear construct into appropriate host</li> <li>Confirmation of positive transformants via PCR</li> <li>Expression confirmation</li> <li>SDS-PAGE and/or Western blot</li> </ul>	
		Pilot expression & purification	2	<ul style="list-style-type: none"> <li>Purified proteins</li> <li>QC data</li> </ul>	<ul style="list-style-type: none"> <li>1 L yeast culture expression</li> <li>One-step purification or additional purification to reach purity of 90% or higher</li> <li>QC by SDS-PAGE, Western blot, and MALDI-TOF (optional)</li> </ul>	
		Large scale protein production & purification (optional)	2-3	<ul style="list-style-type: none"> <li>Yeast paste/ Purified proteins</li> <li>QC data</li> </ul>	<ul style="list-style-type: none"> <li>Large-scale production up to 2,000 L (Employs fermenters and TFF large-scale filtration system)</li> <li>Deliverables available at 90% purity or higher</li> <li>Tag removal</li> </ul>	

## Large Scale Protein Production

GenScript has the state-of-the-art fermentation/bioreactor equipment and expertise for large scale product recovery. Our versatile and reliable protein expression platforms include fermenters, wave mixers, and bioreactors, which accommodate different scales of protein production, from milligrams to a few hundreds grams.

Large Scale Protein Production Capabilities			
Expression	System	Capacity (Liters)	Description
Bacteria	Fermenter	500	<ul style="list-style-type: none"> <li>Transformed bacterial culture for large-scale fermentation, up to 2,000 L</li> <li>Provides homogeneous recombinant proteins, over 98% pure, for crystallization, and partially purified recombinant proteins, over 70% pure</li> <li>Provides large quantities of protein, up to several grams</li> </ul>
Mammalian	WaveMixer	200	<ul style="list-style-type: none"> <li>Provides one single system for the production of final homogeneous recombinant proteins; from gene synthesis to expression; for orders of up to 100 mg</li> <li>Permits transient expression of customers' proteins of interest, up to 10 mg in 10 days</li> <li>Provides conditioned media and cell pellets from stable cell lines, up to 500 L, using a wave mixer system</li> </ul>
Insect	WaveMixer	100	<ul style="list-style-type: none"> <li>High titer recombinant baculovirus stock carrying the customer's gene, up to 10<sup>9</sup> pfu/ml</li> <li>Provides homogeneous recombinant proteins, over 98% pure, for crystallization</li> <li>Provides partially purified recombinant proteins, over 70% pure</li> <li>Provides a large scale protein production option, up to few hundred milligrams, using insect cells and a wave mixer system</li> </ul>
Yeast	Fermenter	500	<ul style="list-style-type: none"> <li>Yeast culture up to 2,000 L for large-scale fermentation</li> <li>Provides homogeneous recombinant proteins, over 98% pure, for crystallization</li> <li>Provides partially purified recombinant proteins, over 70% pure</li> <li>Provides large quantities of protein, up to grams</li> </ul>

## Other Protein Services

### HTP Protein Variants

- Obtain **1,000** protein variants in **30** days.
- Cost efficient: Save up to **70%**.
- Flexibility: **Fully customized** to meet all requirements.



### Process Development

- Boost **productivity** and **yield** significantly.
- Purification and assay development **optimization**.
- Comprehensive process research and **cost-effective** process development.



### GLP-Compliant Bioprocess Services

- GenScript provides **GLP-Compliant bioprocess** services to produce recombinant **proteins** and therapeutic **antibodies** that supply your *in vivo* studies, helping you smoothly integrate **your results** for manufacturing and regulatory application.



### Other Services

- Endotoxin** Removal
- Protein **Purification** and **Characterization**
- Protein **Refolding**
- PROtential™** Protein Expression Evaluation and Optimization Service



## Our Technology Examples

<h3>OptimumGene™</h3>	<ul style="list-style-type: none"> <li>Patented gene design and codon optimization technology produces over 10,000 candidate sequences during one round of analysis alone</li> <li>A complex sorting matrix then selects the best sequence for each specific customized request</li> <li>The algorithm optimizes a variety of parameters that are critical to transcription, translation and protein folding and eliminates any codon bias</li> <li>Gives you significant increase in protein expression</li> <li>We have optimized over 50,000 sequences in all major expression systems</li> </ul>
<h3>FoldArt™</h3>	<ul style="list-style-type: none"> <li>High levels of protein expression results in inclusion body formation</li> <li>FoldArt™ is our proprietary <i>in vitro</i> solubilization &amp; refolding platform to recover pure protein from inclusion bodies</li> <li>It includes high-hydrostatic-pressure techniques, small-molecule additives, and column-refolding methods to give you the soluble protein you desire at high purity</li> </ul>
<h3>ToxinEraser™</h3>	<ul style="list-style-type: none"> <li>Endotoxin removal is necessary for several downstream recombinant protein applications but the process can be challenging</li> <li>GenScript's proprietary ToxinEraser™, endotoxin removal technology is based on the affinity matrix of our modified polymyxin B</li> <li>Get more out of your recombinant protein and increase your application-success-rate by using ToxinEraser™</li> </ul>
<h3>Solubility Tags</h3>	<ul style="list-style-type: none"> <li>Our Production Scientists have developed a variety of <i>E. coli</i> expression vectors with unique solubility tags for recombinant soluble protein production</li> <li>With over 95% success rate for <i>E. coli</i> projects, we can guarantee soluble protein delivery even when others fail</li> </ul>

## Quotations & Ordering Information

Quotations & Ordering		
Method	How?	Services Applicable
Phone	1-877-436-7274 (or) 1-732-885-9188	<ul style="list-style-type: none"> <li>All Protein services</li> </ul>
Fax	1-732-210-0262 (or) 1-732-885-5878	<ul style="list-style-type: none"> <li>All Protein services</li> </ul>
Email	protein@genscript.com	<ul style="list-style-type: none"> <li>All Protein services that have word-based quotation inquiry forms</li> </ul>
Online Inquiry	By clicking on "Get a Quote Now" and following the on-screen instructions	<ul style="list-style-type: none"> <li>Found on many service pages</li> </ul>
Online Direct	By clicking on "Get a Quote Now" of the respective page and following the on-screen instructions	<ul style="list-style-type: none"> <li>PROtential™</li> <li>BacPower™</li> </ul>

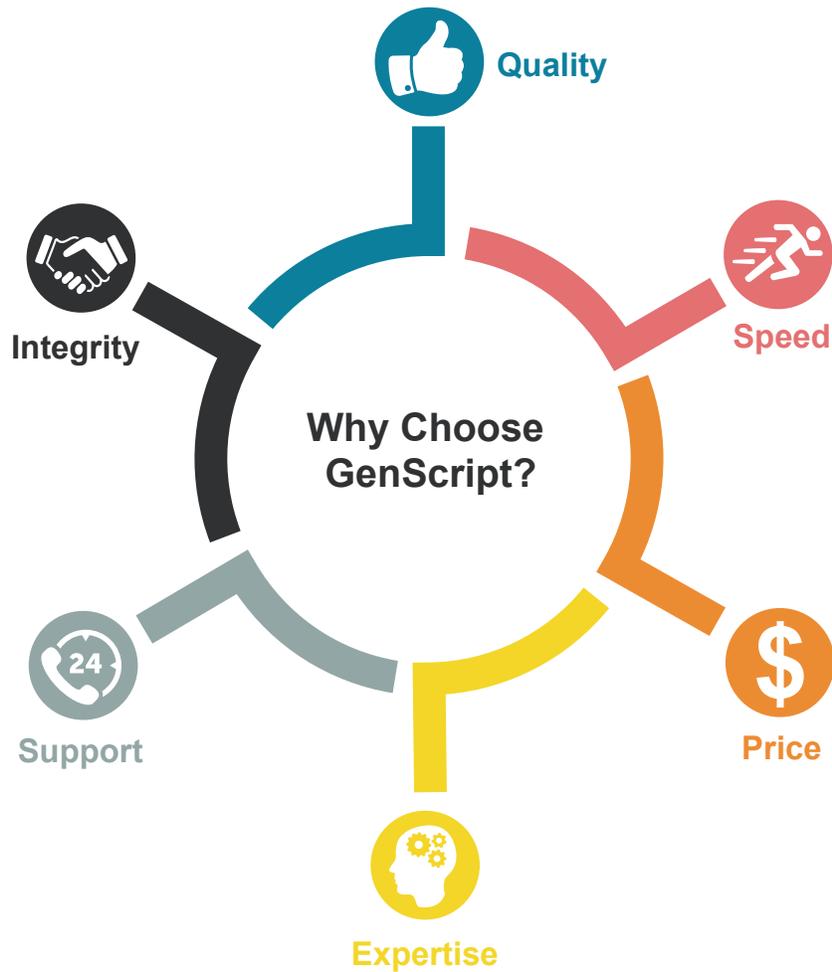
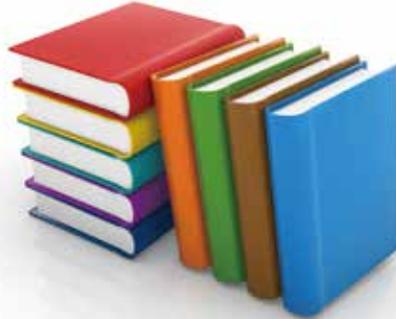
## How to Order



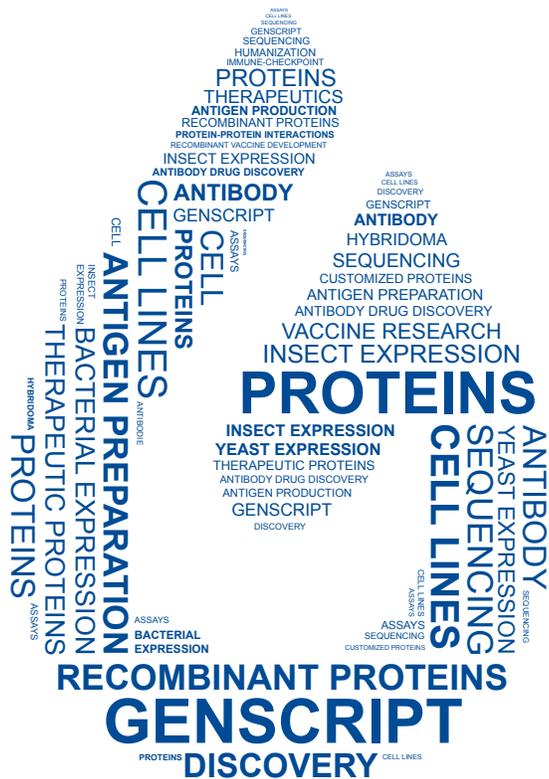
## Our Citations Record

GenScript is proud to serve scientists in over 100 countries, to become the most cited CRO in the world. Please visit [http://www.genscript.com/reference\\_peer-reviewed\\_literature.html](http://www.genscript.com/reference_peer-reviewed_literature.html) for our entire 12,000+ scientific publications and use the search function on page to find publications citing a spectrum of GenScript protein services, including

- ▶ Bacterial expression services
- ▶ Mammalian expression services
- ▶ Insect expression services
- ▶ Yeast expression services



\* Prices shown are subject to change. For the most accurate pricing information, please visit our website.



[www.genscript.com](http://www.genscript.com)

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