Gene to Protein Service

Gene Synthesis Service Sequencing Service *In vitro* Protein Synthesis Service



Gene Synthesis Service Phone: +82-42-930-8777 Email: genesynthesis-support@bioneer.com

Sequencing Phone:+82-42-930-8777 Email: sequencingsupport@bioneer.com

In vitro Protein Synthesis Phone:+82-42-930-8777 Email: proteinsupport@bioneer.com



Gene Synthesis Service

Gene Synthesis Service



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Gene Synthesis Service



Gene Synthesis

Overview

Gene synthesis is the most cost-effective way to enhance your research. You can have your gene cloned in your hand with 100% sequencing confirmation data within for most cases. You can save your time and money through Bioneer's Gene Synthesis Service than through conventional way to clone a gene. If you like, our free codon optimization will increase protein expression rates and can enhance protein function. In addition, our optimization can make previously un-clonable sections of DNA easily.

Bioneer also offers mutagenesis as well as cloning services. Bioneer strives to provide the high-qualified synthetic genes at a reasonable price. Our goal is to provide you the best value for your research dollar.

Gene Synthesis

Description

Empower your research with Bioneer's Custom Gene Synthesis Services.

With 20-year experience of in-house raw material production (phosphoramidite, reagents and solvents), oligo synthesis, and molecular biology reagent production, Bioneer now offers complete Custom Gene Synthesis Service including sequence design, codon optimization, synthesis, cloning and sequencing.

With high-throughput DNA synthesis facilities, Bioneer's daily capacity is unsurpassed. Bioneer is superior in its ability to address the needs of our customers. Whether they need one gene, or one hundred, we respond to their individual needs.

Bioneer is pleased to offer our Custom Gene Synthesis Service to help customers save time and money while improving their research results.

Features and Benefits

100% Sequence Guarantee

Every synthetic gene is 100% confirmed by Sequencing.

Codon Optimization

Complimentary codon optimization for custom gene to enhance protein expression and function.

Value Pricing

Procedure

The best value for your research dollar.

Application

Antibody Construction

Antibodies which target specific diseases or molecules can be codon optimized for maximum expression in the host organism. Also, the antibody library can be constructed to screen for the most efficient antibody variant.

Organism Production Optimization

Optimize expression of genes related to resource production to maximize industrial biological production efficiency.

Gene Construction

Get difficult-to-clone DNA sequences easily and enhance the quality of your research by constructing hypothetical genes.

Protein Modification

Codon optimization may increase protein expression efficiency, and a mutant library derived from this process can yield proteins with increased functional activity. Optimizations include secondary structure removal, and reduction of repeat as well as organism optimizations.





Gene Synthesis

Ordering Information

Gene Synthesis Service				
	1~1,500 bp	Average 7 ~ 12 working days		
Synthesis Period	1,501~3,000 bp	Average 14 ~ 21 working days		
	3001 bp ~	Inquire		
Delivery Form	2~5 ug of lyophilized plasmid			
Cloning Vector	pUC type			
Additional Service	Produce high yield of plasmid DNA, Subcloning			

• Additional charges will apply for gene segments containing complexities such as high or low GC contents, repeat sequences or homopolymeric runs. If any of your sequence is found to contain the above listed complexities, you will be contacted by our Gene Synthesis Specialist.

• When choosing the subcloning service with a commercial vector, cost of vectors will be charged separately.

- We will ship the products after identifying them by sequencing.
- How to order
- 1. Download the ordering form(s)* from the link on Bioneer website.
- 2. Fill out and email the form to: genesynthesissupport@bioneer.com
- 3. We will review the order immediately, and then send you our quote with the service period via email.
- 4. If you decide to proceed, please confirm the quotation by mail.
- 5. The service will be initiated when we send out the service start alert email to you.

*Please fill in the personal information columns (contact information). To fine-tune the service and expedite the order.

Cancellation regulation

There will be a cancellation charge if you cancel gene synthesis before the duration of the guarantee.

 Technical Support genesynthesis-support@bioneer.com

Mutagenesis

Description

Mutagenesis service is the fastest and most cost effective way to construct a mutant gene for protein structure and function research it is used to increase enzymatic function. Site-directed mutation such as Point Mutation as well as deletion, and insertion mutation services are available. For unsurpassed quality and value pricing, be partner with Bioneer through Gene Mutagenesis Service today!

Features and Benefits

+ 100 % Sequence Guarantee

All point mutation as well as deletion mutation products are 100% confirmed by sequencing.

- Codon Optimization Free of charge: Complimentary codon optimization enhance protein expression and function.
- Value Pricing

The best price for your research dollar.

Application

Antibody Construction

Antibodies which target specific diseases or molecules can be codon optimized for maximum expression in the host organism. Also, the antibody library can be constructed to screen for the most efficient antibody variant.

Organism Production Optimization

Optimize expression of genes related to resource production to maximize industrial biological production efficiency.

Gene Construction

Get difficult-to-obtain DNA sequences without a template and upgrade the quality of your research by constructing hypothetical genes.

Protein Modification

Codon optimization may increase protein expression efficiency, and a mutant library derived from this process can yield proteins with increased functional activity. Optimizations include secondary structure removal, and reduction of repeat as well as organism optimizations.

Procedure





Mutagenesis

Ordering Information

Mutagenesis				
Accepted Materials	Plasmid, Cultured <i>E. coli</i> cell			
Service Period	~1 kb	10~15 working days		
	1 kb~3 kb	15~25 working days		
	3 kb~5 kb	25~40 working days		
	5 kb~	inquire		
Additional Service	Produce high yield of plasmid DNA	· · ·		
	Order together with Gene synthesis			

• Additional charges will apply for gene segments containing complexities such as high or low GC contents, repeat sequences or homopolymeric runs. If any of your sequence is found to contain the above listed complexities, you will be contacted by our Gene Synthesis Specialist.

• When choosing the subcloning service with a commercial vector, cost of vectors will be charged separately.

• We will ship the products after identifying them by sequencing.

• If the form of your template DNA is Plasmid/cultured cell form, please provide the vector sequence or vector+insert sequence file separately.

- How to order
- 1. Download the ordering form(s)* from the link on Bioneer website.
- 2. Fill out and email the form to: genesynthesis support@bioneer.com
- 3. We will review the order immediately, and then send you our quote with service period via email.
- 4. If you decide to go ahead with our quote, please confirm the quotation by email.
- 5. The service will be initiated when we send out the service start alert email to you.

(For the Cloning and Mutagenesis services, the service begins when we receive the raw material from you.)

* Please fill in the personal information columns (contact information). to fine-tune the service and expedite the order.

• How to send the template DNA

When sending us the template DNA, For plasmid DNA, the concentration must be $150\sim200$ ng/µl (at least 10μ L volume); For purified PCR product, the concentration must be 50ng/ul (at least 10ul volume).

Address: Synthetic Biology Team, Bioneer, 8-11, Munpyeongseo-ro, Daedeok-gu, Daejeon, 306-220, Korea

- Cancellation regulation
 There will be a cancellation charge if you cancel mutagenesis service before the duration of the guarantee.
 (Guarantee duration: gene synthesis period except delivery time).
- Technical Support genesynthesis-support@bioneer.com

Gene Cloning

Description

Let us perform the time-consuming task of gene cloning, subcloning and sequence verification. Bioneer brings years of experience in molecular biology together with state-ofthe-art QC to guarantee the quality of custom gene cloning service.

Features and Benefits

• 100 % Sequence Guarantee

Individual custom clones are 100% confirmed by sequencing.

• Value Pricing

The best value for your research dollar.

Application

Antibody Construction

Antibodies which target specific diseases or molecules can be codon optimized for maximum expression in the host organism. Also, the antibody library can be constructed to screen for the most efficient antibody variant.

Organism Production Optimization

Optimize expression of genes related to resource production to maximize industrial biological production efficiency.

Gene Construction

Get difficult-to-obtain DNA sequences without a template and upgrade the quality of your research by constructing hypothetical genes.

Protein Modification

Codon optimization may increase protein expression efficiency, and a mutant library derived from this process can yield proteins with increased functional activity. Optimizations include secondary structure removal, and reduction of repeat as well as organism optimizations.

Procedure



Ordering Information

Gene Cloning Service				
Accepted Materials	Plasmid, Cultured E. coli cell			
Service Period	1~6 kb(vector+insert)	~10 working days		
	6~8 kb(vector+insert)	10~15 working days		
	8~10 kb(vector+insert)	15~30 working days		
	10 kb~(vector+insert)	inquire		
Additional Service	Produce high yield of plasmid DNA			
	Proceed with Gene synthesis			

Additional charges will apply for gene segments containing complexities.

• Synthesized genes will be sequenced. Only 100% sequence identity products will be shipped.

• If the form of your template DNA is Plasmid/cultured cell form, please provide the vector sequence or insert sequence file separately.

Additional fees are charged for commercial vector (seller to provide).



Gene Cloning

- How to order
- 1. Download the ordering form(s) * from the link on Bioneer website.
- 2. Fill out and email the form to: genesynthesis-support@bioneer.com
- 3. We will review the order immediately, and then send you our quote with service period via email.
- 4. If you decide to go ahead with our quote, please confirm the quotation by email.
- 5. The service will be initiated when we send out the service start alert email to you.

(For the Cloning and Mutagenesis services, the service begins when we receive the raw material from you.)

- * Please fill in the personal information columns (contact information). To fine-tune the service and expedite the order.
- How to send the template DNA

When sending us the template DNA, For plasmid DNA, the concentration must be 150-200 ng/ul (at least 10 μ l volume); For purified PCR product, the concentration must be 50 ng/µl (at least 10 μ l volume).

Address: Synthetic Biology Team, Bioneer, 8-11, Munpyeongseo-ro, Daedeok-gu, Daejeon 306-220, Republic of Korea

Cancellation regulation

1. There will be a cancellation charge.

 Technical Support genesynthesis-support@bioneer.com

AccuGeneBlock Service

Description

AccuGeneBlock Service provides synthesis of double strand DNA fragments (less than 1 kb) in as little as 3 days. It is a brand new service offered by Bioneer, a leader in Gene Synthesis. AccuGeneBlock service provides you with your gene fragments at a great price with fast turnaround time, so you can use it easily and quickly in synthetic biology research.

AccuGeneBlock products are supplied to you as 200 - 500 ng of lyophilized DNA fragments. The 5' ends are not phosphorylated, and there is a 3' A overhang for TOPO cloning as the default – Note that you may specify bluntends if you choose. Sequence verification is available on request.

AccuGeneBlocks are a low-cost alternative to Gene Synthesis and provide you with high quality DNA – Fast! They are the most convenient and affordable gene construction and/or modification tool available, and make synthetic biology methodology affordable and efficient for every lab.

Features and Benefits

• Value Pricing

The best value for your research dollar (\$95.00 for <500 bp)

Accurate and Fast Synthesis

Fully Automatic Synthesis makes it possible to synthesize high-quality genes in as little as 3 days

• Easy Protein Synthesis

Gene fragments can be used for Protein Synthesis with PCR templates using *ExiProgen*™

Synthesis of large Genes

You may combine multiple AccuGeneBlocks in order to synthesize large Genes through Cloning, Gene Assembly methods, etc.

Codon Optimization - Free of charge!

Complimentary codon optimization on request to enhance protein expression and functionality

Application

Synthesis of large genes

It is possible to make the larger genes by combining multiple AccuGeneBlocks through cloning, Gene Assembly methods, etc. using the double strand DNA provided.

Protein Modification

Codon optimization can increase protein expression levels, and a mutant library derived from this process can provide proteins with enhanced function. Optimizations include the removal of secondary structure and/or repeat reduction, as well as optimization for expression in different organisms.

Antibody Construction

Antibodies which target specific diseases or proteins can be codon-optimized for maximum expression in the host organism. Also, an antibody library can be constructed to screen for the best antibody variant.

Organism Production Optimization

Optimization of gene expression to maximize the efficiency and yield of industrial biological production facilities

Gene Construction

Easy production of hard-to-clone DNA sequences.



AccuGeneBlock Service

Procedure



Ordering Information

AccuGeneBlock Service				
Synthesis Period	<500 bp	3~5 working days		
	501~1000 bp	4~6 working days		
Delivery Form	200 ~ 500 ng of lyophilized PCR product			
Additional Service	Sequencing, Increased quantity, Codon optimization			

• AccuGeneBlock Service may not be available if the gene sequence contains high or low GC contents, repetitive sequence, homopolymeric runs, etc. In these instances please use Bioneer's Gene Synthesis Service.

• Available for gene of <1 kb in size.

• Double-Stranded DNA with a single 3' A overhang is provided as a default. Blunt-ended DNA is available upon request.

• Ordering through email is required for a gene with codon optimization. Other genes may be ordered Online.

Technical Support

genesynthesis-support@bioneer.com

AccuGeneBlock Service FAQ

AccuGeneBlock Gene Synthesis FAQ

Q1. Are there any limitations to gene synthesis by AccuGeneBlock Service?

It is possible to synthesize the DNA up to 1 kb size, that does not have any of the following characteristics: High or Low GC contents, sequence repeats, or invert sequence(s).

Q2. What can I do if my gene contains the adverse factors shown in Question 1?

We recommend using our Gene Synthesis Service in these cases.

Toxic Sequence

Q1. What is Toxic Sequence?

It is DNA sequence of Select Agents and Toxins, which is described in Harmonized screening protocol (http://www.genesynthesi3consortium.org) at International Gene Synthesis Consortium (IGSC).

Q2. Is it possible to synthesize Toxic Sequence? Yes, but you need to submit a consent form from your institute or government that the synthesized Toxic Sequence will be used for research purpose only.



Bioneer Gene Synthesis Service FAQs

Gene synthesis

1. What does Bioneer provide in the Gene Synthesis Service?

We provide 100% sequence-matched gene to our customers in a short time! We have a large capability of oligomer synthesis through "HT-oligo[™]" oligonucleotide synthesizer developed by our own technology. That advantage in oligo synthesis, along with strong background in molecular biology, makes it possible to generate your gene-of-interest with superior quality in an economical way.

2. What is the difference between oligo synthesis and Gene Synthesis?

Oligo synthesis means "chemical" synthesis of DNA. Gene Synthesis also includes a step of oligo synthesis, but it contains additional steps such as analysis of sequences to be synthesized, design and mixing of oligos, ligase chain reaction, PCR and cloning of synthesized gene into a vector.

3. What kind of Gene Synthesis services does Bioneer provide to us?

We provide Gene Synthesis, Mutagenesis, Gene Cloning, and Gene-to-Protein Service.

4. What are the applications of Gene Synthesis?

Gene Synthesis could be used as useful upstream method of various applications. They include antibody construction, organism production optimization, gene construction, protein modification, point mutation and gene cloning.

Quotation and Ordering FAQ

1. How can I get a quotation of Gene Synthesis Service from Bioneer?

You can easily download Bioneer's Standard Order Form "GeneSynthesisServiceOrderUSForm.xlsx" from our website http://us.bioneer.com/products/GeneSynthesis/GeneSynth esisordering.aspx. Please choose service(s) you want to use, fill in everything as much as you can, and email it to geneorder@bioneer.com. We will provide you quotation, including exact pricing and working period for your gene, within 1 business day. 2. Is it helpful to provide sequence information about the gene-of-interest?

Yes, we can give you exact pricing with information about your gene sequence after analysis.

3. What should I do if I have special information, which is necessary for quotation processing but cannot be written on Bioneer's standard ordering form?

Give us note for special information either in body text of your email or in a separated file.

4. Can I get an estimate of Gene Synthesis without information of gene sequence?

You can refer to the following websites to get general idea on pricing of Gene Synthesis.

http://us.bioneer.com/products/GeneSynthesis/GeneSynth esisordering.aspx (Gene Synthesis)

http://us.bioneer.com/products/GeneSynthesis/Cloningord ering.aspx (Cloning)

http://us.bioneer.com/products/GeneSynthesis/PointMutati onordering.aspx (Mutagenesis)

Please note that pricing and working period is dependent on your DNA sequence such as higher/lower GC contents, tandem repeats, inverted repeats, and/or homo-polymeric sequences. Additional price, as well as more working period with no guarantee, would also be applied if synthesized gene has been found to be toxic to *E. coli* or inhibit growth of those organisms.

5. How long does it take for Gene Synthesis Service? When is the starting timepoint?

Please refer to the website shown in the #4. We will start to gene synthesis when we have your confirmation about quotation, and we will start to mutagenesis / cloning service when your genetic materials arrive at Bioneer.

6. Is there any discount if I order large volume of Gene Synthesis?

Please contact us if you want discount for ordering large quantity of Gene Synthesis Service.

Bioneer Gene Synthesis Service FAQs

7. I am fully satisfied with quotation from Bioneer. What should I do to order it?

You simply need to reply to our email of quotation, and tell us that you decided to order it. Our sales representative will contact you shortly.

Technical Support for Gene Synthesis FAQ

1. What is the maximum length of gene can be synthesized?

There is no limitation in its length virtually, but it may take longer time than expected if length is >3 kb. Please contact Bioneer's Gene Synthesis Team for further discussion.

2. Is it possible to generate new vector of gene (form of circular DNA)?

Yes, it is. But it should be noted that pricing and/or working period will be different from that of linear DNA synthesis, because special procedures could be applied.

3. What is the final form product provided to me in Gene Synthesis Service?

Your gene of interest will be given as an insertion into our vector, either pGEM-T easy (standard) or pGEM-B2 (in case of toxic gene) vector, in 2~5 ug of lyophilized plasmid DNA form.

4. Why additional price/more working period could be applied in case of higher/lower GC contents, tandem repeats, inverted repeats, and/or homopolymeric sequence?

PCR is the most popular way to be used for Gene Synthesis. But the existence of repeated sequence or other barriers often prevents success of Gene Synthesis through PCR. In that case design of more or alternative experimental procedures should be required, which result in additional pricing.

5. Is it possible to clone my gene-of-interest into the vector I choose?

Yes, you can also use Bioneer's Gene Cloning Service. Please fill out everything in the third sheet of our standard order form and email it to geneorder@bioneer.com. You will get discount of pricing if you use Gene Synthesis Service and Cloning Service simultaneously.

6. Is it possible to do codon optimization with my gene-of-interest?

Yes. Please choose "Yes" and write exact species in the codon

optimization field of our standard order form.

7. What codon optimization program will be used? We are using the codon optimization program which has been developed by Bioneer and KAIST (Korea Advanced Institute of Science and Technology) together.

8. Can I use that codon optimization program by myself?

Yes. Please visit the following website (http://pombe.kaist. ac.kr/codon/), then choose the species you want for codon optimization from its list. Please call +82-42-930-8793, or +82-42-930-8515 if you want different species other than the list.

Technical Support for Cloning & Mutagenesis Service

1. What should I provide for Gene Cloning Service from Bioneer?

You need to send the following materials;

- 1) a vector for cloning (plasmid DNA; 150~200 ng/µl, >10 ul volume), and
- 2) DNA templates (50 ng/ μ l, >10 ul volume) which will be used as an insert,

through FedEx to the following address;

8-11 Munpyeongseo-ro, Daedeok-gu, Daejeon, 306-220, Republic of Korea

Please let us know if you do not have a vector for cloning. We will purchase that vector from its provider for your project, and pricing of that vector will be added to the final quotation.

2. Is it possible to increase quantity of vector with the cloned gene?

Yes. Five days and \$100 of additional charge will be added per increase of 100 ug of vector.

3. Is directional cloning possible?

Yes. Five days and \$50 of additional charge will be added to the final quote.

4. Can I change gene sequence after my service started?



Bioneer Gene Synthesis Service FAQs

You may change part of your sequence anytime before we complete your order. If that change occurs, you may be charged \$50 (less than 9 bp in either 5'- or 3'- end) or \$100 (less than 20 bp inside the gene). Please contact us as soon as you need to change the sequence.

5. How much do I have to pay if I cancel my order? You will be charged 50% of your quotation price, if you cancel your order within 5 days after you receive confirmation of order email from Bioneer. After 5 days of confirmation email, 80% of your quotation price will be charged.

6. How can I resuspend my gene product? What would be the best storage condition?

You can add 20 ul of distilled water or TE buffer to the delivered DNA, with the final concentration of 250 ng/ul. We recommend the solubilized DNA to be incubated at $4 \degree$ for 10 mins before using it.

You can store the DNA at room temperature in its lyophilized form. For long-term storage, it would be recommended to put DNA in the tube in -20 ℃ freezer.

7. Does Bioneer keep information about my gene and its product after delivery of them to me?

We keep information about your gene and its product for 6 months after delivery. If you want us to dispose it immediately after production, please contact us.



User Protocol

Synthetic gene manual

1. Use it when you want to increase

- a. Add 20 μl of DW or TE buffer into delivered DNA. (Final 250 ng/ul)
- b. Prepare competent cell. (Commercial competent *E. coli* or self-made competent *E. coli*, DH5 $_{\alpha}$ strain is recommended)
- c. Carefully transfer 1μ I of plasmid DNA into the tube prepared in Step b.
- d. Place the tube on ice for 20 minutes.
- e. Heat-shock the cells for 60~90 seconds in a water bath at exactly 42 $\ensuremath{\mathbb{C}}$.
- f. Immediately place the competent cell + DNA mixture back to ice for 3 minutes.
- g. Put the mixture into 10ml of LB+Ampicillin (50µl/ml \sim 100µg/ml) culture medium.
- h. Incubate for overnight at 37 ℃ with shaking (200rpm, about 16hr) and isolate plasmid DNA using Accuprep[®] Plasmid extraction kit.
- i. Restriction enzyme cut or PCR depending on the purpose and use after quantitative measurement of DNA.

- 2. Use it when you want to experiment
 - a. Add 20 μl of DW or TE buffer into delivered DNA. (Final 250 ng/ $\mu l)$
 - After quantitative measurement of DNA, restriction enzyme cut or PCR depending on the purpose and use immediately.
- Delivery form is 5 µg of lyophilized plasmid DNA cloned in MCS site of pUC vector. (Can be stored at room temperature)
- After dissolving DNA in DW or TE buffer, it is recommended that place DNA at 4 °C for 10 minutes.
- ▶ Store at -20 °C after adding DW or TE buffer.
- ▶ Refrigeration of DNA can be a risk of degradation.

BIONEER



Dependencing Service Sequencing Service Sequencing Service

Overview

Bioneer offers our valued customers a high-throughput sequencing service to meet their needs. You can count on Bioneer to provide fast and highly reliable DNA Sequencing data. In order to make it effective Bioneer has an infrastructure of automatic genetic analysis machine ABI 3730XL, which can do sequencing of various template DNA including plasmid DNA, PCR product etc, as well as of welltrained people. Additionally, since we are a major oligo manufacturer, our custom oligos can be provided faster than when using other sequencing services: this is especially relevant for primer walking and Virus/ Vector sequence validation which can be done faster than other services. Bioneer treats your samples like they are our own, and do our best to provide the best service and deliver satisfaction.

Description

Bioneer Sequencing Service is a fast and highly reliable DNA Sequencing Service performed on the ABI 3730XL DNA Analyzer, which provides high-quality of sequence analysis data (Phred Score (QV): \geq 20, Guaranteed read lengths: \geq 700 bp) within 24 hr from the arrival time of sample. Bioneer's long-standing expertise in oligo synthesis technology supports custom primer order and your DNA sequencing needs.

Features and Benefits

• Highly-reliable Sequence Analysis:

This service provides Phred Score (QV): \geq 20 as well as Guaranteed read lengths: \geq 700 bp.

- Fast Turnaround Time: In most cases, the sequence is complete within 24 hr of customer's request.
- Convenience Universal primer is provided free-ofcharge:

Over 40 universal primers are provided free-of-charge. Oligo Synthesis service is also available together with DNA Sequencing.

Competitive Pricing:

Bioneer offers the best value for customer's research dollar.





Sample Preparation Sample Shipping Sequencing Data Delivery Order (Customer) Order • Yield and purity of samples are measured. • Cyclic sequencing reaction using BigDye[™] Terminator is performed. • Sequencing PCR products are purified. • Run sequencing reactions on ABI 3730XL DNA Analyzer. Sequencing • Guaranteed length: \geq 700 bp (based on a normal plasnid DNA) • Phred Score (QV): \geq 20 • Data file (ab1, seq, pdf, or txt) and QC report anr provided. Data Delivery to Customers • Completed analysis data is delivered to customer within 24 hours.

BIONEER Sequencing Service Workflow

Service Type

1. Standard Sequencing Service

The standard sequencing service provides customers with a fast sequencing results of read length up to 700 bp using plasmid DNA or PCR product. disconded price could be available for orders with more than 2,000 reactions per order or 20,000 reactions per year. Please contact us for details.

2. Full-length Sequencing (primer walking) Service

This service is for sequence analysis of plasmid longer than 2 kb including a long insert or PCR product. Its turnaround time is approximately one week for a 3 kb plasmid and can vary depending on a template length. Assembled analysis data will be delivered to a customer along with an aligned file, single config file as well as custom primers.

- 3. Additional Service
- Plasmid DNA Extraction Service: To free up researchers' valuable time, a plasmid prep service is available at additional cost.
- PCR Product Clean-up Service: Template purity is critical in direct sequencing of PCR product. Additional purification of PCR product using gel extraction or spin column PCR clean up kit can also be provided at additional cost to improve the sequencing quality.
- PCR & Purification Service: Simply send a template and primers with information about PCR conditions and expected amplicon size to Bioneer. Then we will perform PCR, validate and purify the PCR product, and run sequencing.

Sample Submission Guidelines

1. Sample Preparation

Template

Туре	Concentration	Volume/rxn
Plasmid DNA	150~200 ng/µl	10-15 µl
Purified PCR product	50 ng/µl	10-15 µl
Non-purified PCR product	50 ng/µl	≥20 µl

Primer

Туре	Concentration	Volume/rxn
Plasmid DNA	150~200 ng/µl	10-15 µl
Purified PCR product	50 ng/µl	10-15 µl



- 2. Shipping Guidelines
- Please submit your samples and primers in 1.5 ml centrifuge tubes or 96-well V-bottom PCR plates. If you use 96-well PCR plates, please arrange the samples vertically (A01→H01).



		1	2	3	4	5	6	7	8	9	10	11	12
	А	1	9	17	25	33	41	49	57	65	73	81	89
	В	2	10	18	26	34	42	50	58	66	74	82	90
	С	3	11	19	27	35	43	51	59	67	75	83	91
	D	4	12	20	28	36	44	52	60	68	76	84	92
	Е	5	13	21	29	37	45	53	61	69	77	85	93
	F	6	14	22	30	38	46	54	62	70	78	86	94
	G	7	15	23	31	39	47	55	63	71	79	87	95
1	/н	8	16	24	32	40	48	56	64	72	80	88	96

- Seal the tubes and plates to prevent leakage, sample evaporation and cross-well contamination.
- Please label your sample names clearly on the top of tube. Labeled names should match the ones listed on your order sheet. To ensure efficient processing of samples, Bioneer recommend that you use simple name for your sample. If the sample name is too long (more than xx[c1] characters), please mark the tubes and leave a note on the order sheet.
- Please place each sample and its corresponding primers in separate bags and write down your name on each bag.
- You can send your samples to us via FedEx (preferred), DHL or TNT. When your order is confirmed, you will receive an account number of a carrier service that you chose to create a shipping label.
- [Shipping address: 8-11, Munpyeongseoro, Daedeok-gu, Daejeon 306-220, Republic of Korea]
- Fill out an order sheet and email it to sequencing@bioneer.com.

3. Universal Primer List

Primer name	Sequence(5'> 3')
T7promoter	TAA TAC GAC TCA CTA TAG GG
T7terminator	GCT AGT TAT TGC TCA GCG G
T3	AAT TAA CCC TCA CTA AAG GG
SP6	ATT TAG GTG ACA CTA TAG
EBV-R	GTG GTT TGT CCA AAC TCA TC
BGH-rev	CTA GAA GGC ACA GTC GAG GC
M13F(-40)	GTT TTC CCA GTC ACG AC
M13R(-40)	CAG GAA ACA GCT ATG AC
M13F(-20)	GTA AAA CGA CGG CCA GT
M13R(-20)	GCG GAT AAC AAT TTC ACA CAG G
pGEX5	GGC AAG CCA CGT TTG GTG
pGEX3	GAG CTG CAT GTG TCA GAG G
pQE-forward	CCC GAA AAG TGC CAC CTG
pQE-reverse	GTT CTG AGG TCA TTA CTG G
EGFP-C	CAT GGT CCT GCT GGA GTT CGT G
EGFP-N	CGT CGC CGT CCA GCT CGA CCA G
RVprimer3	CTA GCA AAA TAG GCT GTC CC
RVprimer4	GAC GAT AGT CAT GCC CCG CG
GLprimer1	TGT ATC TTA TGG TAC TGT AAC TG
GLprimer2	CTT TAT GTT TTT GGC GTC TTC CA
CMV-F	CGC AAA TGG GCG GTA GGC GTG
CMV30	AAT GTC GTA ATA ACC CCG CCC CGT TGA CGC
CMV24	TAT TAG GAC AAG GCT GGT GGG CAC
Gal4AD	TAC CAC TAC AAT GGA TG
Gal4BD-F	TCA TCG GAA GAG AGT AG
Gal4BD-R	TTT CTT TGG AGC ACT TGA GC
MATCHMAKER3	GTG AAC TTG CGG GGT TTT TCA GTA TCT ACG AT
pBAD-For	ATG CCA TAG CAT TTT TAT CC
pBAD-Rev	GAT TTA ATC TGT ATC AGG
SV40-pArev	CCT CTA CAA ATG TGG TAT GG
SV40-pAF	AAA TAA AGC AAT AGC ATC AC
malEF	GGT CGT CAG ACT GTC GAT GAA GCC
27F	AGA GTT TGA TCM TGG CTC AG
1492R	TAC GGY TAC CTT GTT ACG ACT T
pCold-F	ACG CCA TAT CGC CGA AAG G
pCold-R	TCC CCG CCA AAT GGC AGG GA

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Ordering Information and Quote Request

Cat. No.	Service Description
Sequencing Service	
S-3010-1	Standard Sequencing Service, <96 rxns
S-3010-2	Standard Sequencing Service, \geq 96 rxns
S-3010-6	Full length Sequencing (primer walking) Service
Additional service	
S-3010-0	Plasmid DNA Preparation Service
S-3010-3	PCR Purification Service
S-3010-4	Agarose Gel Extraction Service
S-3010-5	PCR & Purification Service
S-3010-7	Custom Sequencing Primer Synthesis Service (on 25 nmole scale)



Bioneer Corporation In vitro Protein Synthesis

In vitro Protein **Synthesis**



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In vitro Protein Synthesis Service

Description

In vitro Protein synthesis Service from Bioneer uses the *ExiProgen*[™], the World's first protein synthesis and nucleic acid extraction system. Bioneer's protein synthesis service uses *E. coli* cell-free protein synthesis followed by affinity purification of your protein using Histidine tag. In addition, Bioneer provides the protein in the storage buffer of your choice via dialysis, which is customer-oriented service. As this service uses cell-free protein synthesis, customer gets your protein synthesis faster than with cell-based protein synthesis services.

Service information

This service is only for genes cloned into *E. coli* Expression vectors, such as pET vectors, that have a T7 Promoter, ribosome binding site and T7 terminator.

Saving Time with Bioneer's protein synthesis service



Note 1) If customer has their gene of interest in an expression vector such as a pET *E. coli* expression vector, they can get faster results. Note 2) If customer has optimized their gene's codon for *E. coli* expression, they can get significantly better results.

Features and Benefits

Fast process

Bioneer's process is based on cell free protein synthesis so customer can get results faster there are no cell culture steps.

High performance

This service provides the ideal solution for proteins which are toxic to *E. coli* and do not work *in vivo*.

Compatibility

If customer's gene works in any other expression system, it will work with the *ExiProgen*[™] EC Protein Synthesis Kit

Customized Service

Bioneer can customize our processes to customer's needs. The purified protein can be provided in the buffer of their choice.



In vitro Protein Synthesis Service

▶ Schematics of Protein synthesis service



▶ Sample type for this service

Vector Source of Gene	pBIVT or others in vitro specialized vectors	pET vectors	Non-expression vector (e.g. pUC19)
E. coli	Type 1		
Others (E. coli codon optimized)	Type 2		Type 4
Others (original)	Тур	e 3	

Note 1) For Type 1 & 2, there are no fees incurred if there is no protein synthesis.

Note 2) For Type 3, there are some Set-up charges even if there is no protein synthesis.

Note 3) For Type 4, Bioneer cannot accept this type of vector for protein synthesis. If customer wants, Bioneer provides the Cloning service to clone your template DNA into an appropriate expression vector. Once this is done, pricing & schedules follow the rules for Type 1-3 vector/inserts.

▶ Service fee

Protein Synthesis Service (Cat. No. S-2500)		
Basic Synthesis fee	\$600.00 (Below Molecular weight 30 kDa)	
Additional fee	31 kDa ~ 80 kDa	\$100.00 per addition of 10kDa
	> 81 kDa	Inquire
Synthesis Duration	Around 5-14 business days depending on Molecular weight (from receiving date of your DNA template to completion of protein synthesis)	
Amounts of protein	Approximately 100 μg (Concentration; 1 mg/mL) (Please contact Bioneer if larger amounts of protein is required.)	
Storage condition	Storage buffer, unless customer provides customized composition of their own storage buffer • Basic Storage buffer : 20 mM Tris-Cl (pH 7.6), 100 mM NaCl, 1 mM DTT, 1 % NP-40, and 50 % Glycerol	

If protein synthesis fails to provide your protein, Bioneer only charges a Set-up fee (\$100.00) for Type 3 samples.

▶ If you have any further questions, please contact Bioneer's protein team through an email (proteinsupport@bioneer.co.kr) or on the phone (+82-42-930-8777).

In vitro Protein Synthesis Service FAQs

FAQ

Q1. How can I use your protein synthesis service?

You can download the order form for our Protein Synthesis Service on the Bioneer website. After you fill out the order form (excel file), email it to Bioneer at <u>proteinorder@</u> <u>bioneer.co.kr</u>. Within 24 hr (except for weekends and holidays), Bioneer sends a detail quote on pricing and timeframes. After you check this information, please confirm your intent to order by e-mailing Bioneer again. Bioneer then sends shipping instructions and begins work after your sample is received. After the service is complete, Bioneer would send another mail to confirm the results.

Q2. What is sizes and type for this protein synthesis? The size of proteins can range from 10 to 120 kDa. The amount of synthesized protein depends on many factors, such as the origin of the gene, codon optimization of the gene into *E. coli*, and the number of disulfide bonds in the synthesized protein, if any.

Q3. What kinds of solution provided after protein synthesis service?

After protein syntheses and purification, Bioneer performs dialysis with the buffer of your choice, if provided. Bioneer provides $100 \ \mu g$ of protein at a concentration of $100 \ m g/m l$.

Q4. If I have expression vector, how can I sent to?

You can send your expression vector for protein synthesis (plasmid DNA 150-200 μ g/ml, in a volume of > 10 μ g) via DHL (If you use another parcel service, you need to pay your own delivery fee.).

Q5. If we don't have an expression vector, can we use this service?

Yes. You can still use this service. You may use Bioneer's Gene Synthesis service for your gene using Bioneer's codon optimization for *E. coli* expression, and have the gene placed in pBIVT expression vector. In this case, you need to pay additionally for the gene synthesis. If you would like to contact Bioneer for gene synthesis, please email at sales@bioneer.com or contact our Gene Synthesis Team (+82-42-930-8793, 8515).

Q6. What is the cost if I cancel this service in the middle of synthesis process?

Within two days after order	30 % of quotation fee
Between two to five days after the order	50 % of quotation fee
Between six and fourteen days after order	80 % of quotation fee
Fourteen days or more after you order if we have not been able to synthesize protein	Free for Type 1 and 2 samples. (\$100.00 charge for Type 3 Samples)