# Мутагенез и клонирование

## Технические характеристики


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Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
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Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
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Ярославль (4852)69-52-93

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Казахстан (7172)727-132

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# The Next-Generation of Molecular Biology

The foundational techniques of molecular biology are changing. Synthetic biology approaches to engineering biological systems and organisms have driven innovations in both DNA synthesis and assembly. Agilent's products bring these novel tools into the reach of every molecular biology lab, improving the speed and reliability while reducing the cost of next-gen cloning and mutagenesis.

## Stratagene LABS. Agilent-Backed Quality.

Cutting-edge molecular and synthetic biology solutions to accelerate your research.

Since 1984, Stratagene products have been used throughout the academic, industry and government research sectors in fields spanning molecular biology, genomics, proteomics, drug discovery and toxicology. In 2007, Agilent Technologies integrated Stratagene's labs, which now form the primary research and development branch of Agilent's genomics division.

Agilent

STRATAGENE
An Agilent Technologies Company

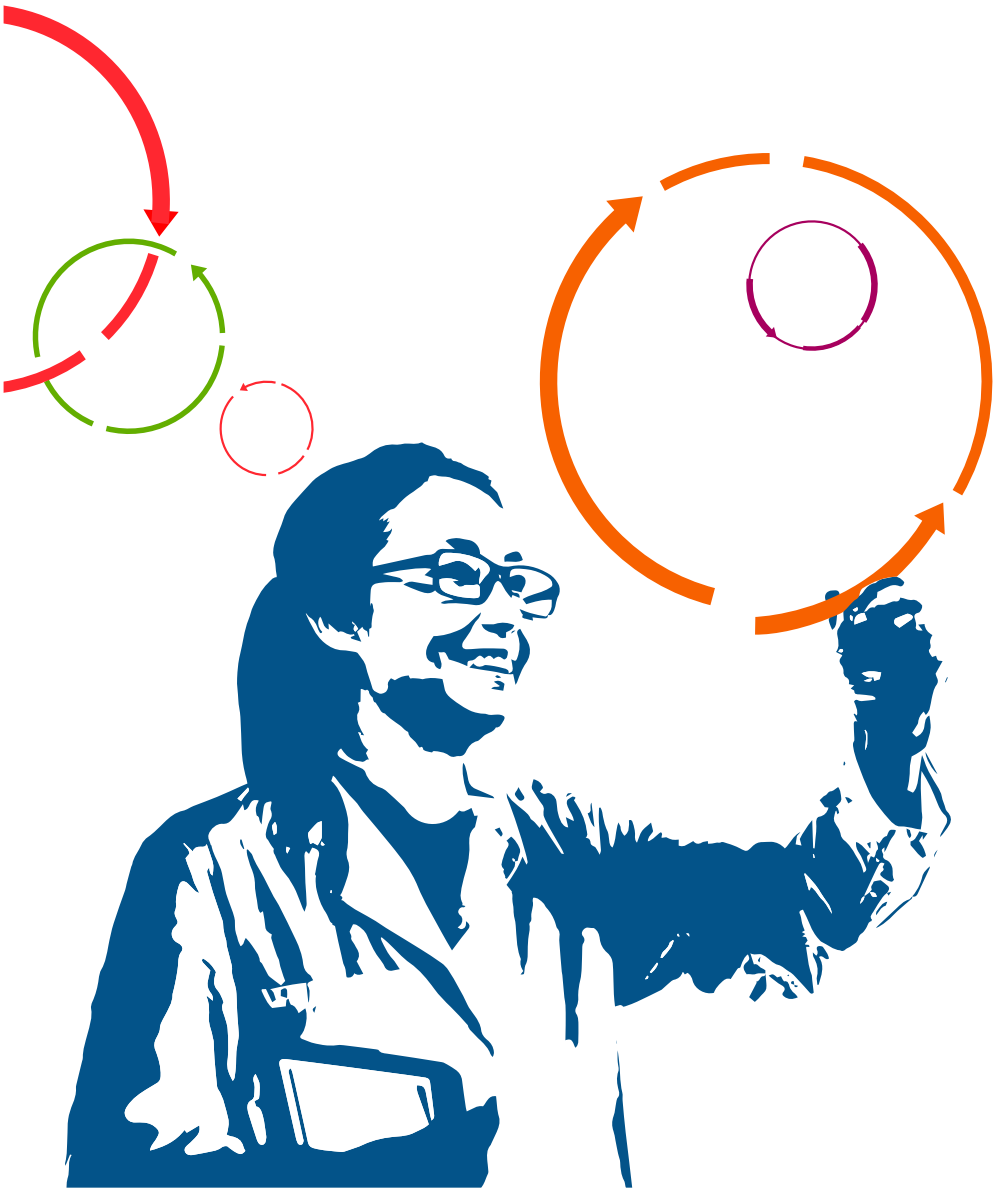
# SureVector Next-Gen Cloning Kits

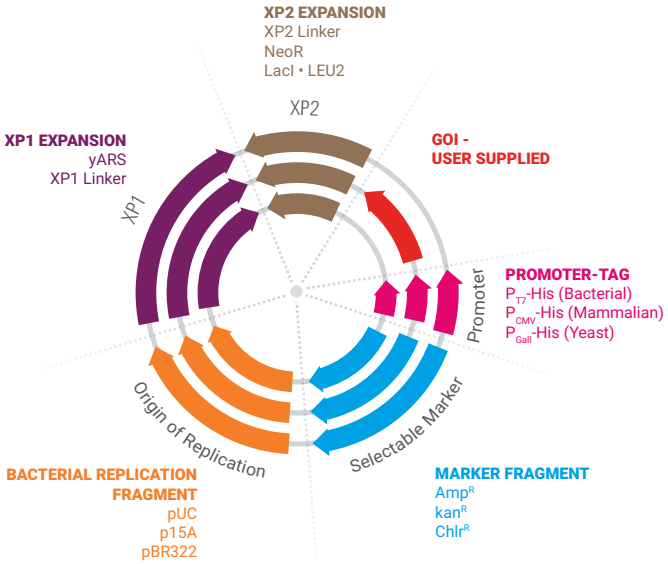
## Your Vision. Your Vectors.

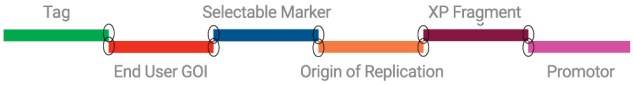
SureVector, the world's first modular vector system, harnesses the power of synthetic biology to provide quick, user-friendly customization of cloning and expression vectors. In contrast to alternative next-gen cloning technologies, SureVector offers a unique set of standard parts that can be assembled into an endless supply of custom vectors—all with a validated assembly system you can count on.

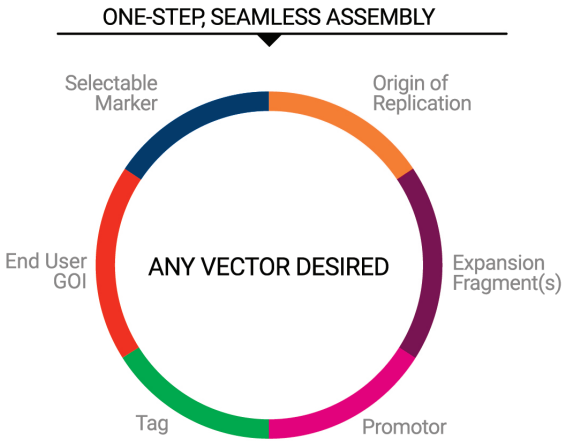
### How does SureVector work?

A single SureVector kit contains a set of DNA fragments which are the functional "parts" of most cloning and expression vectors. These parts can be assembled into any combination desired, resulting in customized vectors. The proprietary SureVector enzymes can assemble up to seven fragments into a circularized plasmid in a single, 20-minute reaction.





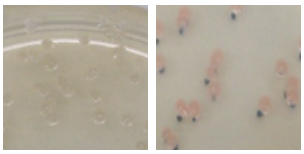




## Fast, Flexible, Reliable.

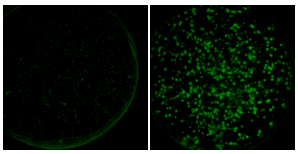
- **Rapid custom vector generation**
  Less than a day from design to vector, compared to four weeks for custom vector services
- **Reliable and precise assembly**
  SureVector is extensively validated to ensure standard parts can be interchanged without loss of functionality
- **More flexible than traditional systems**
  Assemble new vectors in your lab as experimental requirements change, rather than ordering a new one
- **Control your experiments**
  Take control of your experiments by troubleshooting your DNA assembly—not your service provider's

## Multi-Organism Functionality



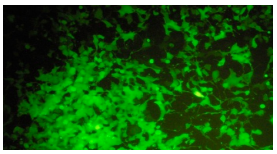
### Bacteria

Bacterial expression using SureVector's T7 promoter. Pink colonies on the right express fluorescent protein when T7 is present, while negative controls (left) do not.



### Yeast

The presence of LEU2 gene in the SureVector expansion slot (right) allows yeast to grow on leucine deficient media.



### Mammalian

Stable mammalian cell lines using the neomycin resistant fragment from the SureVector kit.

# SureVector Next-Gen Cloning Kits (Continued)

## Agilent SureVector System Fragments & Kit Numbers

| | *E. coli* | Mammalian | Yeast |
|---|---|---|---|
| **Promoters** | T7 (G7515A-B, G7518B-E) | CMV (G7516A-B) | GAL1 (G7517A-B) |
| | Tac (G7515A-B, G7518B-C) | SV40 (G7516A-B) | CUP1 (G7517A-B) |
| | Rhamnose (G7515A-B, G7518C) | EF-1α (G7516A-B) | ADH1 (G7517A-B) |
| **Tags** | CBP (G7515A-B, G7518E) | 3xFLAG (G7516A-B) | 3xFLAG (G7517A-B) |
| | DsbA (N-term only) (G7515A) | GFP (G7516A-B) | GFP (G7517A-B) |
| | GST (N-term only) (G7515A, G7518D) | 3xHA (G7516A-B) | 3xHA (G7517A-B) |
| | HA (C-term only) (G7515B) | 6xHis (G7516A-B) | 6xHis (G7517A-B) |
| | 6xHis (G7515A-B, G7518B-C) | c-Myc (G7516A-B) | c-Myc (G7517A-B) |
| | MBP (N-term only) (G7515A, G7518D) | SBP (G7516A-B) | SBP (G7517A-B) |
| | c-Myc (C-term only) (G7515B) | | |
| | SBP (G7515A-B, G7518D-E) | | |
| | Thioredoxin (C-term only) (G7515B, G7518E) | | |
| **Bacterial Selection** | AmpR (G7514A, G7518A-E) | AmpR (G7514A, G7518A-E) | AmpR (G7514A, G7518A-E) |
| | CamR (G7514A, G7518A) | CamR (G7514A, G7518A) | CamR (G7514A, G7518A) |
| | KanR (G7514A, G7518A) | KanR (G7514A, G7518A) | KanR (G7514A, G7518A) |
| **Bacterial Origins of Replication** | pUC (G7514A, G7518A-E) | pUC (G7514A, G7518A-E) | pUC (G7514A, G7518A-E) |
| | p15A (G7514A) | p15A (G7514A) | p15A (G7514A) |
| | pBR322 (G7514A) | pBR322 (G7514A) | pBR322 (G7514A) |
| **XP1 Fragments** | XP1 (G7514A, G7518A-E) | XP1 (G7514A, G7518A-E) | yARS (G7514A) |
| | | | XP1 (G7514A, G7518A-E) |
| **XP2 Fragments** | LacI (G7514A, G7518A-E) | Blasticidin (G7516A-B) | URA3 (G7517A-B) |
| | XP2 (G7514A) | Hygromycin (G7516A-B) | HIS3 (G7517A-B) |
| | | Puromycin (G7516A-B) | Hygromycin (G7517A-B) |
| | | NeoR (G7514A) | LEU2 (G7514A) |
| | | XP2 (G7514A) | XP2 (G7514A) |
| **Promoter-Tag Fusions** | T7-HIS6 (G7514A, G7518A-B, G7518D) | CMV-HIS6 (G7514A) | GAL1-HIS6 (G7514A) |

# Mutagenesis Products

## Efficiency Without Compromise

From rational design to random mutations, Agilent offers mutagenesis solutions for any application. Agilent offers the only widely available commercial technology that is not PCR based, so you don't have to sacrifice error rate for efficiency.

### Market-leading QuikChange Mutagenesis

QuikChange kits have provided researchers with a fast, easy and efficient non-PCR method to reliably perform site-directed mutagenesis since 1996. Other commercially-available kits utilize PCR-based techniques, which can propagate errors with each successive round of thermal cycling. The QuikChange method uses a linear amplification strategy with only the parental strand serving as the DNA template. Combining this with our highest fidelity polymerases leads to a significant reduction in unwanted second-site errors. The existence of such errors is likely to complicate and delay downstream screening and analysis.

### QuikChange Lightning Multi

- Fast, reliable and easy QuikChange protocol
- Mutate up to three sites simultaneously using a single QuikChange reaction

### QuikChange Lightning

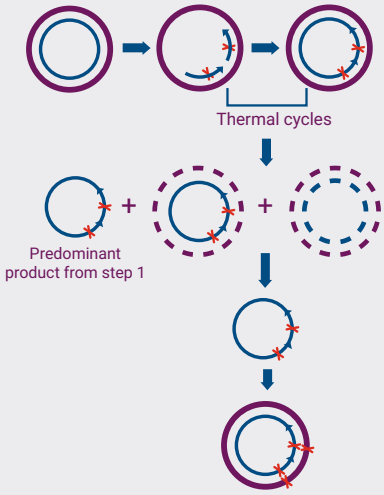
- 75% reduction in thermocycling time compared to original QuikChange enzyme blend
- More efficient with improved colony yields
- >80% mutation efficiency for both short and long templates (up to 14 kb)

### GeneMorph II

- More uniform mutational spectrum when performing error-prone PCR
- GeneMorph II kits utilize Mutazyme II DNA polymerase, a novel error prone PCR enzyme blend, with equivalent mutation rates at As and Ts vs. Gs and Cs

### The 'Lightning Advantage'

The QuikChange Lightning Kit contains specially engineered enzymes that have been designed to shorten the time necessary to complete our signature 3-step protocol. Extension times for the thermal cycling process have been reduced by 75% and digestion of the non-mutated parental template has been decreased to only five minutes.




### QuikChange Lightning Multi

1. **Mutant Strand Synthesis**
   Perform thermal cycling to:
   - Denature DNA template
   - Anneal mutagenic primers (all primers bind to the same strand)
   - Extend primers and ligate nicks with QuikChange Multi enzyme
2. **Dpn I Digestion of Template**
   - Digest methylated and hemimethylated DNA with Dpn I
3. **Transformation**
   Transform mutated ssDNA into XL10-Gold ultracompetent cells, which synthesize the complementary strand

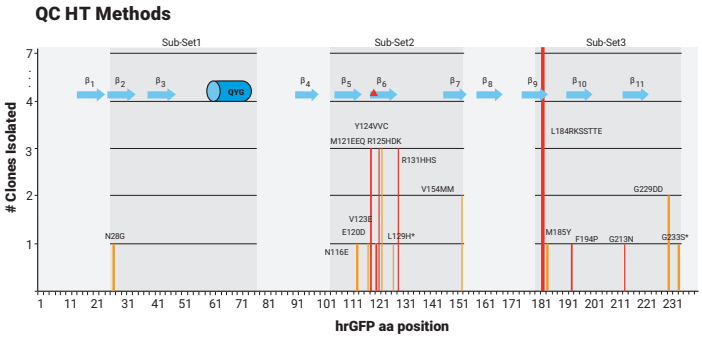
# Mutagenesis Products (Continued)

## QuikChange HT Protein Engineering System

QuikChange technology meets high-throughput DNA synthesis to provide access to rationally-designed oligo libraries for protein engineering applications. The QuikChange HT Protein Engineering System provides rapid resolution of structural and functional questions by creating libraries of rationally-designed mutants for applications such as single amino acid scanning, site saturations scanning or targeted combinatorial mutagenesis.

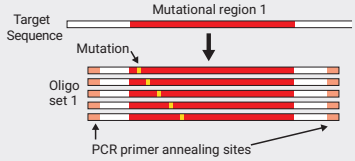
### Key Features:

- Rapidly generate a rational design library of protein variants—less than a full day of hands-on time compared to weeks of waiting for a gene variant library
- Reduced cost of library generation—only pennies per mutant compared to $20 or more for gene variant libraries

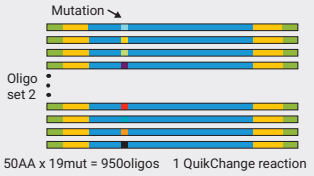



An example of the QuikChange HT kit applied to engineering of a GFP variant with enhanced brightness. Using site saturation mutagenesis yielded several beneficial mutations.

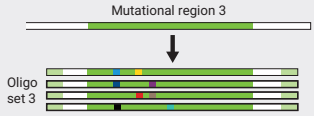
**Use QuikScan1 to determine relevant stability:** Separately replaces each amino acid in the wild type mutational region with a particular amino acid. Often used for Alanine scanning to quickly identify key functional or structural amino acids.




**Use QuikScan19 to identify single codon replacements that improve binding, function or stability:** Codon saturation scanning, systematically replaces each amino acid in the wild type mutational region with all 19 other amino acids, resulting in 19 mutagenic oligos for each amino acid position in the mutational region.




**Use QuikCombine to discover a multisite mutant with improved structure, function and stability:** Combine multiple mutants in groups of 1–4 position with defined variation at each site. Make up to 1.2x10$^4$ libraries for a single 50AA set or combine a few identified variants and validate functional relevance.




Three possible mutational strategies using QuikChange HT: Alanine-scanning, site saturation scanning and combinatorial mutagenesis.

| Product | Uses | Part Number |
|---|---|---|
| **QuikChange Mutagenesis** | | |
| QuikChange Lightning Multi | Use for up to 3 mutations simultaneously, 10 or 30 reaction kits | 210514, 210516 |
| QuikChange Lightning | Single site mutagenesis, 10 or 30 reaction kits | 210518, 210519 |
| **QuikChange HT Protein Engineering System** | | |
| QuikChange HT | Use for targeting up to 10 different 50 amino acid long regions in a protein | G5900A |
| QuikChange HT | Use for targeting up to 20 different 50 amino acid long regions in a protein | G5900B |
| QuikChange HT | Use for targeting up to 10 different 67 amino acid long regions in a protein | G5901A |
| QuikChange HT | Use for targeting up to 20 different 67 amino acid long regions in a protein | G5901B |
| **Random Mutagenesis** | | |
| GeneMorph II | Mutagenic polymerase for balanced random mutagenesis | 200550, 200552 |

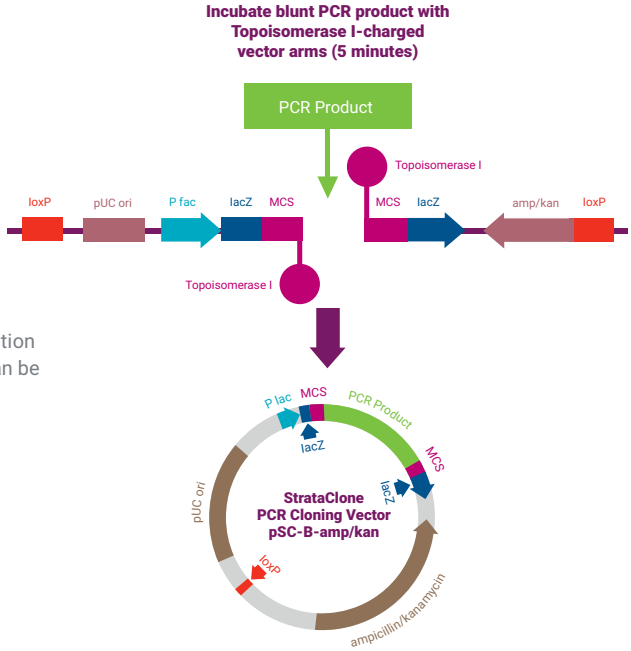
# Specialty Cloning Products

## A Solution for Every Situation

When you have a difficult cloning project, Agilent offers everything from a traditional topoisomerase based kit to a huge selection of catalog vectors for any application.

### StrataClone PCR Cloning Kit

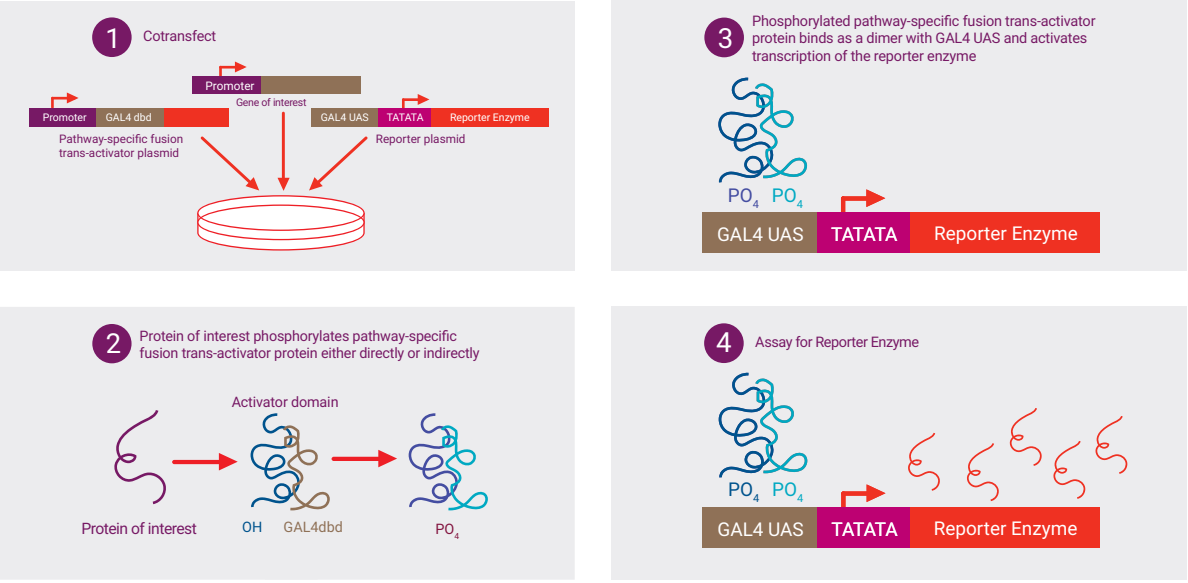
The StrataClone PCR Cloning Kit allows high-efficiency, 5-minute cloning of PCR products at room temperature, using the efficient DNA rejoining activity of DNA topoisomerase I and the DNA recombination activity of Cre recombinase. These kits are available for both blunt-end and UA cloning.




The blunt end StrataClone kit is perfect for use with our new Cas9 programmable restriction enzyme kit. Cas9 can be used to produce a linear fragment of DNA with blunt ends that can be rapidly cloned into the StrataClone vector.

### PathDetect *Cis* and *Trans*-Reporting Systems

Determine if a gene product or compound activates pathways leading to specific enhancers with our PathDetect *Cis* and *Trans*-Reporting systems.




The PathDetect in vivo signal transduction pathway *trans*-reporting system.

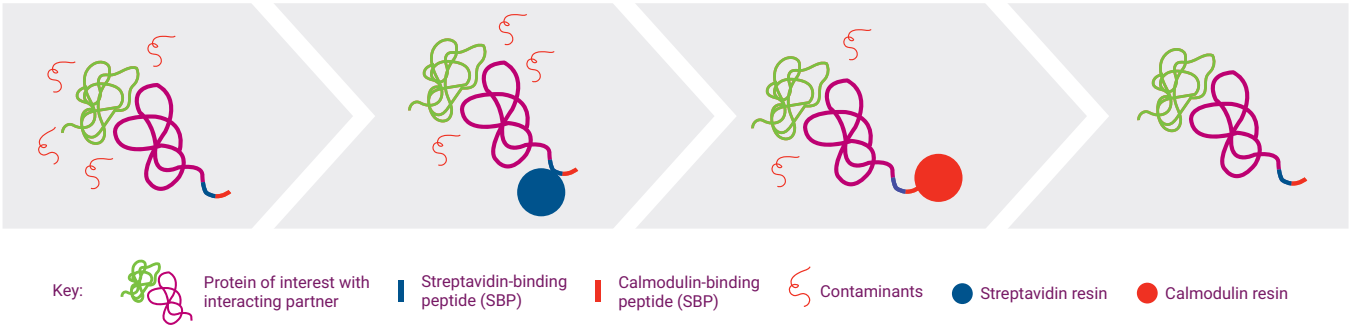
# Specialty Cloning Products (Continued)

### InterPlay TAP Systems for Protein-Protein Interactions

The InterPlay Mammalian TAP System allows you to recover interacting proteins from mammalian cells. Tandem affinity purification yields your tagged protein and interacting proteins using gentle washing and small molecule elution conditions.

### Two Easy Purification Steps

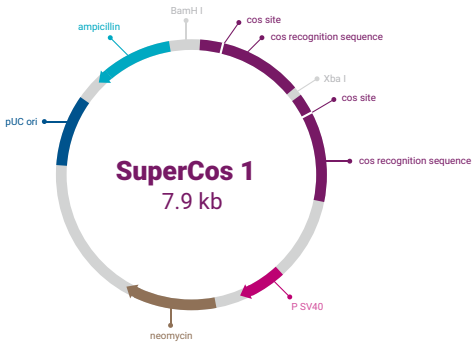
To purify proteins with the TAP protocol, apply the mammalian cell lysate to the streptavidin resin, then elute using biotin, and apply that eluate to a calmodulin resin. Once you elute with EGTA, you will get exceptionally clean proteins.




## Specialty Vectors

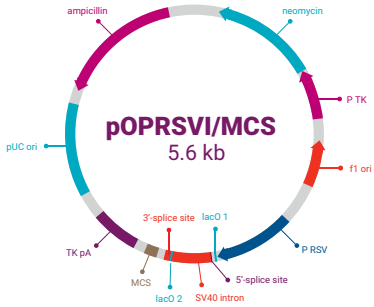
### SuperCos 1

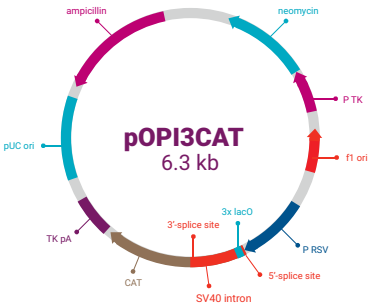
SuperCos 1 is a novel, 7.9 kb cosmid vector that contains bacteriophage promoter sequences flanking a unique cloning site.




### LacSwitch II

The LacSwitch II inducible mammalian expression system utilizes an improved vector system in which several elements of the lac operon have been modified for use in eukaryotic cells for inducible gene expression.



| Product | Part Number |
|---|---|
| **StrataClone Systems** | |
| StrataClone PCR Cloning Kit | 240205 |
| StrataClone Blunt Cloning Kit | 240207 |
| StrataClone Ultra Blunt Cloning Kit | 240218 |
| ***Trans*-Reporting Systems** | |
| PathDetect c-Jun *trans*-Reporting System | 219000 |
| PathDetect Elk1 *trans*-Reporting System | 219005 |
| PathDetect CREB *trans*-Reporting System | 219010 |
| PathDetect CHOP *trans*-Reporting System | 219015 |
| pFA-ATF2 Plasmid | 219026 |
| pFA-cFos Plasmid | 219031 |
| pFA-CMV Plasmid | 219036 |
| pFR-CAT Plasmid | 219001 |
| pFR-βGal Plasmid | 219002 |
| pFR-SEAP Plasmid | 219004 |
| pFA-CHOP Plasmid | 219054 |
| pFA2-CREB Plasmid | 219068 |
| pFA2-Elk1 Plasmid | 219062 |
| pFA2-cJun Plasmid | 219053 |
| pFR-Luc Plasmid | 219050 |
| **InterPlay TAP Systems for Protein-Protein Interactions** | |
| InterPlay N-Terminal Mammalian TAP System Kit | 240103 |
| InterPlay C-Terminal Mammalian TAP System Kit | 240104 |
| InterPlay N-Terminal Mammalian TAP Vectors, 3 x 20 µg | 240101 |
| InterPlay C-Terminal Mammalian TAP Vectors, 3 x 20 µg | 240102 |
| InterPlay Mammalian TAP Purification Kit | 240107 |
| InterPlay Adenoviral N-terminal TAP | 240213 |
| Interplay Adenoviral C-terminal TAP | 240215 |
| InterPlay N-Terminal Mammalian TAP Vectors, 3 x 20 µg | 240214 |
| InterPlay C-Terminal Mammalian TAP Vectors, 3 x 20 µg | 240216 |

| Product | Part Number |
|---|---|
| **Path Detect *Cis*-Reporting Systems** | |
| AP-1 *cis*-Reporting System | 219073 |
| NF-κB *cis*-Reporting System | 219077 |
| SRF *cis*-Reporting System | 219081 |
| ISRE *cis*-Reporting System | 219092 |
| NFAT *cis*-Reporting System | 219094 |
| C/EBP *cis*-Reporting System | 240111 |
| DR3 *cis*-Reporting System | 240115 |
| Egr-1 *cis*-Reporting System | 240129 |
| GRE *cis*-Reporting System | 240133 |
| pAP-1-hrGFP Plasmid | 240049 |
| pNF-κB-hrGFP Plasmid | 240051 |
| pLuc-MCS Plasmid | 219087 |
| CRE *cis*-Reporting System | 219075 |
| SRE *cis*-Reporting System | 219079 |
| p53 *cis*-Reporting System | 219083 |
| GAS *cis*-Reporting System | 219093 |
| TARE *cis*-Reporting System | 219095 |
| DR1 *cis*-Reporting System | 240113 |
| DR5 *cis*-Reporting System | 240119 |
| LILRE *cis*-Reporting System | 240131 |
| DR4 *cis*-Reporting System | 240135 |
| pCRE-hrGFP Plasmid | 240050 |
| pNFAT-hrGFP Plasmid | 240053 |
| **Specialty Vectors** | |
| SuperCos (10 rxn kit) | 251301 |
| LacSwitch II system | 217450 |

# Viral Expression Systems

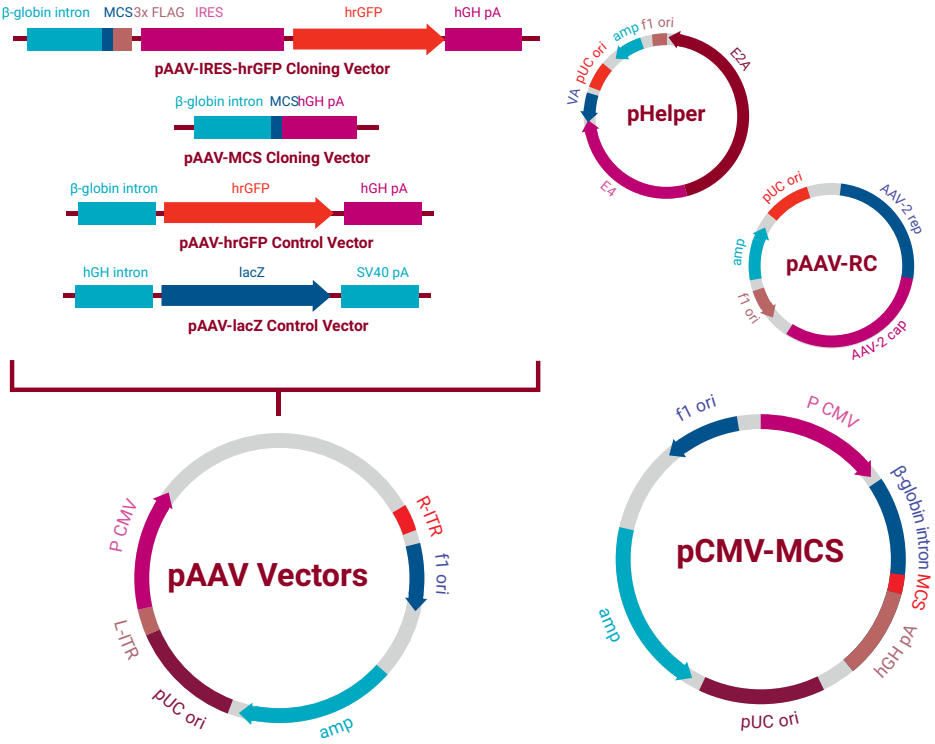
## High-Efficiency Gene Delivery Starts Here

As synthetic biology moves out of the prokaryote and into eukaryotic systems, the need to study gene expression in a native host is becoming increasingly important. Many of these hosts are difficult or impossible to transfect, meaning progress may be limited by hosts that easily accept DNA using traditional transfection methods. To solve this problem, viral-based gene delivery systems have been developed for exceptionally high-efficiency gene delivery to a broader range of hosts.

| Application | Long-Term Gene Expression | Transient, High-Level Gene Expression | Functional Cloning Assays |
|---|---|---|---|
| System | AAV Helper-Free System | AdEasy™ Adenoviral Systems | ViraPort Retroviral Expression System |
| Advantages | • Infects both dividing and non-dividing cells<br>• Long-term, stable gene expression<br>• Unparalleled biosafety profile | • High-level protein production<br>• Infects both dividing and non-dividing cells<br>• Homologous recombination in *E. coli* saves weeks of work | • Integrates into host genome for stable expression<br>• Copy number controlled by multiplicity of infection<br>• Functionally screen cDNA libraries in mammalian cells<br>• Pre-made libraries available |

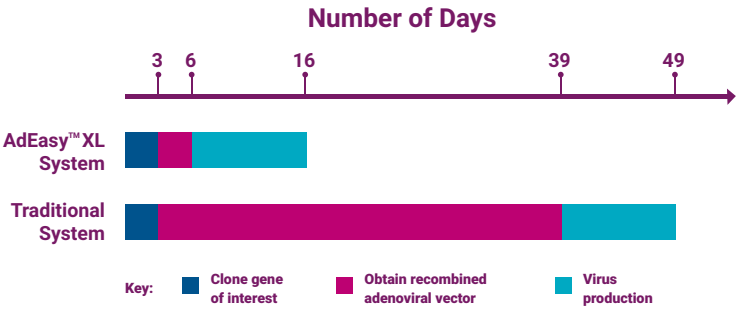
### AAV Helper-Free

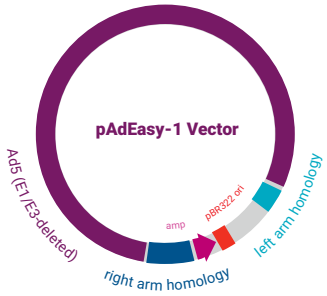
The AAV Helper-Free System improves upon recombinant adeno-associated virus-2 (AAV-2) technology by eliminating the need for helper virus. It allows safe, high-efficiency gene delivery and long- term expression in a broad range of hosts.

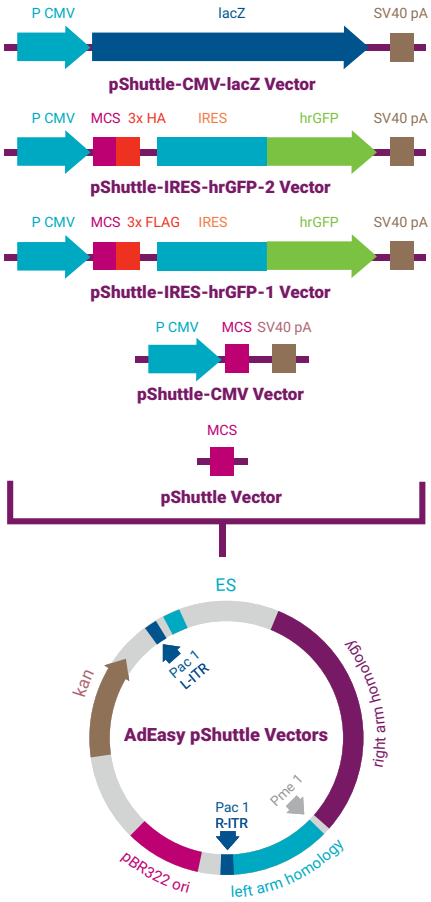


## AdEasy™ XL and AdEasy™ Systems

The AdEasy™ XL and AdEasy™ Adenoviral Vector Systems save you a month of work over traditional methods by producing the recombinant adenoviral plasmid by homologous recombination in *E. coli*. Now you can obtain your recombinant plasmid after a simple transformation.




## ViraPort

Our ViraPort retroviral gene expression system is superior to standard transfection technology. High transduction efficiency and large cloning capacity (up to 8 kb) make the system ideal for building and screening complex libraries.

### ViraPack Transfection Kit

| System | AAV | AdEasy™ XL | ViraPort | Transfection |
|---|---|---|---|---|
| **Gene delivery efficiency** | >90% | >90% | >90% | ~20% |
| **Host: Dividing cells** | + | + | + | + |
| **Host: Non-dividing cells** | + | + | - | - |
| **Long-term expression** | + | - | + | + |
| **Transient expression** | - | + | - | + |
| **High-titer virus** | + | + | - | N/A |
| **Host immunogenecity** | - | + | - | N/A |
| **Maximum insert size** | 3 kb | 7.5 kb | <8 kb | Variable |
| **Selection for stable cells** | +/- | N/A | - | + |

# Viral Expression Systems (Continued)

| Product | Quantity | Part Number |
|---|---|---|
| **AAV Helper-Free System** | | |
| AAV Helper-Free System<br>+ pAAV-MCS vector, 10 µg<br>+ pCMV-MCS vector, 10 µg<br>+ pAAV-lacZ vector, 10 µg<br>+ pAAV-RC vector, 20 µg<br>+ pHelper vector, 20 µg<br>+ AAV-293 cells, 1x10$^6$ cells<br>+ AAV HT1080, 1x10$^6$ cells | 1 kit | 240071 |
| pAAV-hrGFP Vector | 20 µg | 240074 |
| pAAV-IRES-hrGFP Vector | 20 µg | 240075 |
| AAV-293 Cells | 1 x 10$^6$ cells | 240073 |
| AAV-HT1080 Cells | 1 x 10$^6$ cells | 240109 |

| Product | Quantity | Part Number |
|---|---|---|
| **ViraPort® Retroviral Gene Expression System** | | |
| pFB Retroviral Vector | 10 µg | 217563 |
| pFB-Neo Retroviral Vector | 10 µg | 217561 |
| pVpack-GP Vector | 20 µg | 217566 |
| pVpack-Eco Vector | 20 µg | 217569 |
| pVpack-Ampho Vector | 20 µg | 217568 |
| pVpack-10A1 Vector | 20 µg | 217570 |
| pVpack-VSV-G Vector | 20 µg | 217567 |
| Vitality® pFB-hrGFP plasmid vector | 10 µg | 240027 |
| pFB-Neo-lacZ plasmid vector | 10 µg | 240029 |
| pFB-Luc plasmid vector | 10 µg | 240030 |

| Product | Quantity | Part Number |
|---|---|---|
| **ViraPack Transfection Kit** | | |
| ViraPack Transfection Kit | 1 kit | 200488 |

| Product | Quantity | Part Number |
|---|---|---|
| **AdEasy™ and AdEasy™ XL Adenoviral Vector Systems** | | |
| AdEasy™ XL System<br>+ pShuttle vector, 20 µg<br>+ pShuttle-CMV vector, 20 µg<br>+ pShuttle-CMV-lacZ control vector, 10 µg<br>+ BJ5183-AD1 electroporation-competent cells, 5 x 100 µl<br>+ XL10-Gold® ultracompetent cells, 5 x 100 µl<br>+ pUC18 DNA control plasmid, 10 µl<br>+ AD-293 cells, 1 x 10$^6$ cells | 1 kit | 240010 |
| BJ5183-AD1 electroporation-competent cells | 5 x 100 µl | 200157 |
| AdEasy™ Adenoviral Vector System<br>+ pAdEasy-1 vector, 2.5 µg<br>+ pShuttle vector, 20 µg<br>+ pShuttle-CMV vector, 20 µg<br>+ pShuttle-CMV-lacZ vector, 10 µg<br>+ BJ5183 electroporation-competent cells, 5 x 100 µl<br>+ XL10-Gold® ultracompetent cells, 5 x 100 µl<br>+ pUC18 DNA control plasmid, 10 µl | 1 kit | 240009 |
| BJ5183 electroporation-competent cells | 5 x 100 µl | 200154 |
| pAdEasy-1 vector | 2.5 µg | 240005 |
| pShuttle vector | 20 µg | 240006 |
| pShuttle-CMV vector | 20 µg | 240007 |
| pShuttle-CMV-lacZ control vector | 10 µg | 240008 |
| pShuttle-IRES-hrGFP-1 | 20 µg | 240081 |
| pShuttle-IRES-hrGFP-2 | 20 µg | 240082 |

# Competent Cells

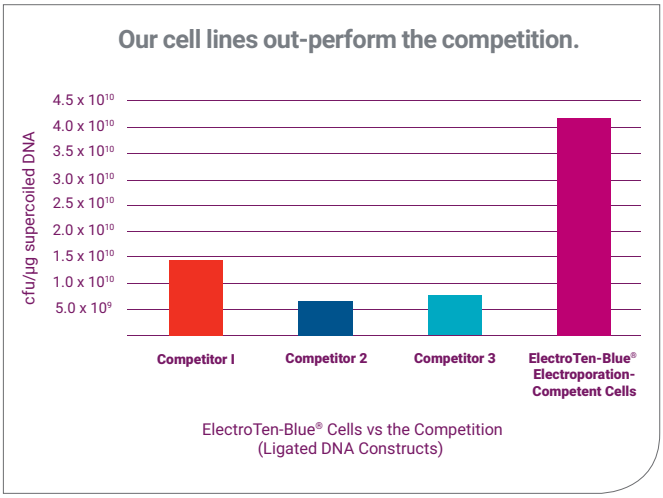
## Explore a wider selection

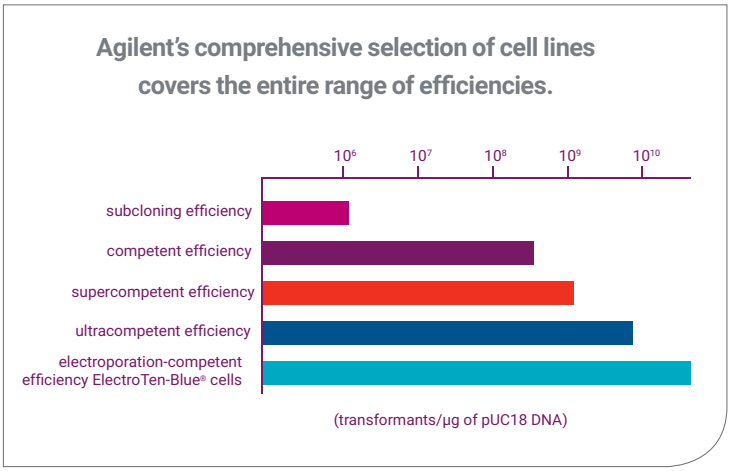
Finding the right competent cells is easy with Agilent—we have a comprehensive selection of strains for all your next-generation cloning needs.

### Cloning Cells

**The Highest Efficiency**

Our Ultracompetent Cells provide the highest transformation efficiency in the world, making it easier and faster to obtain an accurate clone. At Agilent Technologies, we understand the less time you spend worrying about cloning, the more time you can spend answering your research questions.



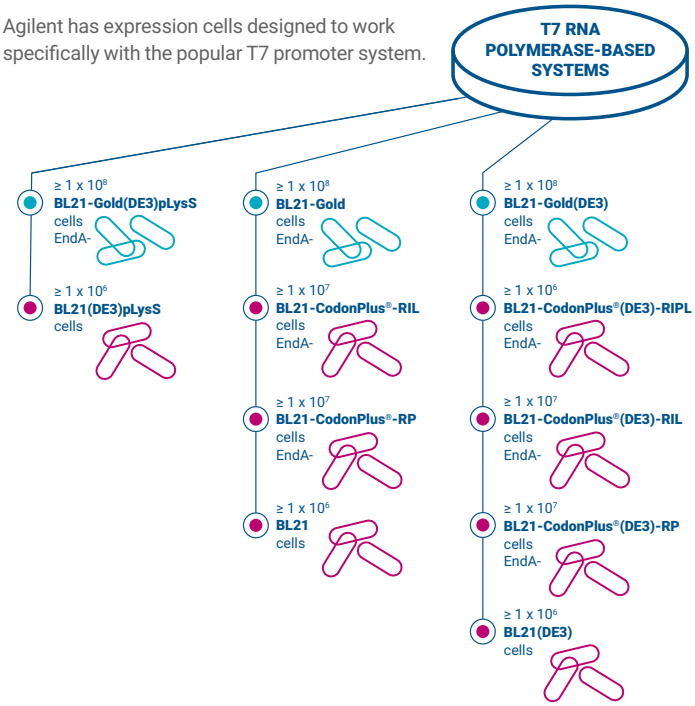




### Expression Cells

**The Widest Selection**

We aren't content just to have the best competent cells. Agilent has designed strains for protein expression, plasmid stability, large plasmids and toxic proteins as well as everyday cloning. Our complete line of competent cells includes specialty cells for a huge variety of applications, each backed by Agilent's reputation for the best quality in the field.

Agilent has expression cells designed to work specifically with the popular T7 promoter system.



# Competent Cells (Continued)

| Product | Uses | Transformation Efficiency | Resistance | Part Number |
|---|---|---|---|---|
| **Cloning Cells** | | | | |
| SURE 2 Supercompetent Cells | Unstable clones; DNA with secondary structure | >1 x $10^9$ | Tetracycline, Kanamycin, Chloramphenicol | 200152 |
| SURE Electroporation Competent Cells | DNA with secondary structure, difficult | >1 x $10^{10}$ | Tetracycline, Kanamycin, Chloramphenicol | 200227 |
| SURE Competent Cells | DNA with secondary structure, routine | >5 x $10^8$ | Tetracycline, Kanamycin, Chloramphenicol | 200238 |
| ABLE C Electroporation Competent Cells | For toxic clones | >5 x $10^9$ | Tetracycline, Kanamycin | 200161 |
| ABLE K Electroporation Competent Cells | For toxic clones | >5 x $10^9$ | Tetracycline, Kanamycin | 200162 |
| ABLE C Competent Cells | For toxic clones | >5 x $10^6$ | Tetracycline, Kanamycin | 200171 |
| ABLE K Competent Cells | For toxic clones | >5 x $10^6$ | Tetracycline, Kanamycin | 200172 |
| TG1 Competent Cells | For phage libraries; Phage display libraries | 1 x $10^{10}$ | N/A | 200123 |
| XL10-Gold Ultracompetent Cells | Large plasmids, ligated DNA, or plasmid libraries | >5 x $10^9$ | Tetracycline and Chloramphenicol | 200314, 200315 |
| XL10-Gold KanR Ultracompetent Cells | Large plasmids, ligated DNA, or plasmid libraries; plasmids with CamR | >5 x $10^9$ | Tetracycline and Kanamycin | 200317 |
| ElectroTen-Blue® Electroporation Competent Cells | Ligated DNA and generating libraries | >3 x $10^{10}$ | Tetracycline and Kanamycin | 200159 |
| SoloPack Gold Supercompetent Cells | High efficiency, single reaction format | >1 x $10^9$ | Tetracycline and Chloramphenicol | 230350 |
| SoloPack Gold Competent Cells | Routine cloning, single reaction format | >1 x $10^8$ | Tetracycline and Chloramphenicol | 230325 |
| 96Pack Gold Competent Cells | Routine cloning, higher throughput format | >1 x $10^8$ | Tetracycline and Chloramphenicol | 200324 |
| XL1-Blue Electroporation Competent Cells | Electroporation | >1 x $10^{10}$ | Tetracycline | 200228 |
| XL1-Blue MRF Electroporation Competent Cells | Electroporation, Methylated DNA | >1 x $10^{10}$ | Tetracycline | 200158 |
| XL2-Blue Ultracompetent Cells | Highest cloning efficiency | >5 x $10^9$ | Tetracycline and Chloramphenicol | 200150 |
| XL2-Blue MRF Ultracompetent Cells | Highest cloning efficiency for methylated DNA | >5 x $10^9$ | Tetracycline and Chloramphenicol | 200151 |
| XL1-Blue Supercompetent Cells | Highest cloning efficiency | >1 x $10^9$ | Tetracycline | 200236 |
| XL1-Blue MRF Supercompetent Cells | Highest cloning efficiency for methylated DNA | >1 x $10^9$ | Tetracycline | 200230 |
| XL1-Blue MRF Kan Supercompetent Cells | Highest cloning efficiency for methylated DNA and tetracycline resistant plasmids | >1 x $10^9$ | Kanamycin | 200248 |
| XL1-Blue MR Supercompetent Cells | For cloning without the F' episome | >1 x $10^9$ | N/A | 200229 |
| XL1-Blue Competent Cells | For routine cloning | >1 x $10^8$ | Tetracycline | 200249 |
| XL1-Blue Subcloning Grade Competent Cells | Cloning when DNA is not limited | >1 x $10^6$ | Tetracycline | 200130 |

| Product | Uses | Transformation Efficiency | Resistance | Part Number |
|---|---|---|---|---|
| **Expression Cells** | | | | |
| TKX1 Cells | For phosphoprotein generation | >5 x $10^7$ | Tetracycline, Kanamycin | 200124 |
| TKB1 Cells | For phosphoprotein generation | >5 x $10^5$ | Tetracycline | 200134 |
| ArcticExpress Competent Cells | Enhanced solubility | >5 x $10^6$ | Tetracycline | 230191 |
| ArcticExpress (DE3) Competent Cells | Enhanced solubility | >5 x $10^6$ | Tetracycline | 230192 |
| ArcticExpress (DE3) RIL Competent Cells | Enhanced solubility | >5 x $10^6$ | Tetracycline | 230193 |
| ArcticExpress (DE3) RP Competent Cells | Enhanced solubility | >5 x $10^6$ | Tetracycline | 230194 |
| ArcticExpress RIL Competent Cells | Enhanced solubility | >5 x $10^6$ | Tetracycline | 230195 |
| ArcticExpress RP Competent Cells | Enhanced solubility | >5 x $10^6$ | Tetracycline | 230196 |
| BL21-CodonPlus (De3)RIPL Competent Cells | Eliminate codon bias, use with pET or pCAL | >1 x $10^6$ | Chloramphenicol and Streptomycin/ Spectinomycin | 230280 |
| BL21-CodonPlus (De3)RIL Competent Cells | Eliminate codon bias, use with pET or pCAL | >1 x $10^7$ | Tetracycline and Chloramphenicol | 230245 |
| BL21-CodonPlus (De3)RP Competent Cells | Eliminate codon bias, use with pET or pCAL | >1 x $10^7$ | Tetracycline and Chloramphenicol | 230255 |
| BL21-CodonPlus RIL Competent Cells | Eliminate codon bias, for non-T7 expression systems | >1 x $10^7$ | Tetracycline and Chloramphenicol | 230240 |
| BL21-CodonPlus RP Competent Cells | Eliminate codon bias, for non-T7 expression systems | >1 x $10^7$ | Tetracycline and Chloramphenicol | 230250 |
| BL21-CodonPlus (De3) RIL-X Competent Cells | Methionine auxotroph for x-ray crystallography | >1 x $10^7$ | Tetracycline | 230265 |
| BL21-CodonPlus (De3) RP-X Competent Cells | Methionine auxotroph for x-ray crystallography | >1 x $10^7$ | Tetracycline | 230275 |
| BL21-Gold | Increased efficiency and EndA-, use with toxic proteins and non-T7 systems | >1 x $10^8$ | Tetracycline | 230130 |
| BL21-Gold (De3) | Increased efficiency and EndA-, use with non-toxic proteins | >1 x $10^8$ | Tetracycline | 230132 |
| BL21-Gold (De3) pLysS | Increased efficiency and EndA-, use with toxic or non-toxic proteins | >1 x $10^8$ | Tetracycline and Chloramphenicol | 230134 |
| BL21 | Use with non-T7 systems or with lambda-CE6 for toxic proteins | >1 x $10^6$ | Tetracycline | 200133 |
| BL21 (De3) | Use with non-toxic proteins | >1 x $10^6$ | Tetracycline | 200131 |
| BL21 (De3) pLysS | Use with toxic or non-toxic proteins | >1 x $10^6$ | Chloramphenicol | 200132 |
| XL1-Red Cells | For random mutagenesis | N/A | Tetracycline | 200129 |

# 1. Site-Directed Mutagenesis

## 1.1. QuikChange Lightning

The fastest and latest generation of the market-leading QuikChange kits speeds up the protocol for performing single and multiple site-directed mutagenesis to less than 3 hours. These QuikChange Lightning kits, like their predecessors, are based on a linear amplification method whereby mutation-containing primers are incorporated but not copied. The protocols of other commercially available kits rely on PCR-based methods, which may result in unwanted second-site errors. The QuikChange Lightning Kit allows you to introduce point mutations, insertions, or deletions twice as fast compared to earlier kit versions, and the QuikChange Lightning Multi Kit delivers mutants up to three times faster than our original multi-site mutagenesis kit—both kits accomplish this without sacrificing the mutagenesis efficiency, reliability and accuracy you have come to expect from the QuikChange name.

- For single site mutagenesis, one kit accommodates both short and long templates (4-14 Kb)
- >80% mutagenesis efficiency for 1 site; >55% mutagenesis efficiency for 3 mutations simultaneously

| cat.no | description | unit |
|---|---|---|
| 210515<br>210513 | **QuikChange Lightning Multi Site-Directed Mutagenesis Kit -** QuikChange Lightning Multi Site-Directed Mutagenesis Kit contains optimized enzyme formulations that maintain the same accuracy and efficiency of previous QuikChange kits while performing the reaction at up to 50% faster. For academic use only. | 10rxn<br>30rxn |
| 210516<br>210514 | **QuikChange Lightning Multi Site-Directed Mutagenesis Kits** QuikChange Lightning Multi Site-Directed Mutagenesis Kit contains optimized enzyme formulations that maintain the same accuracy and efficiency of previous QuikChange kits while performing the reaction at up to 50% faster. | 10rxn<br>30rxn |
| 210518<br>201519 | **QuikChange Lightning Site-Directed Mutagenesis Kit, 30 Rxn** Contains optimized enzyme formulations that maintain the same accuracy and efficiency of previous QuikChange kits while performing the reaction at up to 50% faster. | 10rxn<br>30rxn |

## 1.2. QuikChange II

The second generation of our QuikChange method that provides improved fidelity over our original kit, while maintaining greater than 80% mutation efficiency for single site mutagenesis.

- Includes *PfuUltra* High-Fidelity DNA Polymerase to minimize unwanted errors
- Complete kit provides all reagents necessary to support mutagenesis (at single sites), for large constructs, and for use with electroporation competent cells.

| cat.no | description | unit |
|---|---|---|
| 200521<br>200522 | **QuikChange II XL Site-Directed Mutagenesis Kit, 30 Rxn**<br>The highest fidelity mutagenesis kit for large plasmids | 10rxn<br>30rxn |
| 200523<br>200524 | **QuikChange II Site-Directed Mutagenesis Kit, 30 Rxn**<br>The highest fidelity site-directed mutagenesis kit allows you in 3 easy steps to introduce a variety of mutations in any vector in a single day. | 10rxn<br>30rxn |
| 200555 | **QuikChange II-E (Electroporation) Site-Directed Mutagenesis Kit**<br>The highest fidelity site-directed mutagenesis kit allows you in 3 easy steps to introduce a variety of mutations in any vector in a single day. Sufficient for 10 reactions. | 10rxn |

## 1.3. QuikChange

The original QuikChange Site-Directed Mutagenesis Kits eliminate the need for subcloning into M13-based bacteriophage vectors and for ss-DNA rescue. This makes site-directed mutagenesis studies simple and reliable since it allows oligo-mediated introduction of site-specific mutations into virtually any double-stranded plasmid DNA. The XL version of the kit is specialized for efficient mutagenesis of large (4 -14 kb) or otherwise difficult-to mutagenize plasmid templates and features components specifically designed for more efficient DNA replication and bacterial transformation. The QuikChange Multi system allows mutagenesis at multiple sites (up to 5) in a single round, using a single oligonucleotide per site.

- >80% mutagenesis efficiency for 1 site; >55% mutagenesis efficiency for 3 mutations simultaneously
- Efficient and accurate linear amplification minimizes unwanted errors

| cat.no | description | unit |
|---|---|---|
| 200515<br>200514 | **QuikChange Multi Site-Directed Mutagenesis Kit - Academic, 30 Rxn**<br>Included is a license for limited use. Novel, robust technology for complex, multi-site mutagenesis in a single reaction. This kit is for academic entities only. | 10rxn<br>30rxn |
| 200517<br>200516 | **QuikChange XL Site-Directed Mutagenesis Kit, 30 Rxn**<br>The kit provides rapid and reliable method for site directed mutagenesis for large constructs. | 10rxn<br>30rxn |
| 200519<br>200518 | **QuikChange Site-Directed Mutagenesis Kit, 10 Rxn**<br>The kit provides a rapid and reliable method for site directed mutagenesis. | 10rxn<br>30rxn |
| 200531<br>200513 | **QuikChange Multi Site-Directed Mutagenesis Kit - Commercial, 10 Rxn**<br>Included is a license for limited use. Novel, robust technology for complex, multi-site mutagenesis in a single reaction. This kit is for commercial entities only. | 10rxn<br>30rxn |

# 2. Random Mutagenesis

## 2.1. GeneMorph II

The GeneMorph II Random Mutagenesis Kits have been formulated to produce a more uniform mutational spectrum when performing error prone PCR to achieve random mutagenesis. Other methods or commercially available kits that rely on Taq DNA polymerase for random mutagenesis have shown biases towards mutating A's and T's more frequently than G's and C's, which undoubtedly skews representation of random mutant libraries. GeneMorph II kits utilize Mutazyme II DNA polymerase, which is a novel error prone PCR enzyme blend with equivalent mutation rates at A's and T's vs. G's and C's. Additionally, to address the need for efficient and flexible cloning methods while delivering this less biased mutational spectrum, the GeneMorph II EZClone Domain Mutagenesis Kit offers an easy and fast cloning method to perform targeted random mutagenesis on protein domains and promoter elements and eliminates the need to have specific restriction sites.

- Superior yields over a wide target range - 0.1 to 6 kb
- Easily change mutation frequency by altering concentration of input template
- Efficient mutagenesis rates of 1 to 16 bases per kb

| cat.no | description | unit |
|---|---|---|
| 200550 | **GeneMorph II Random Mutagenesis Kit**<br>The GeneMorph II random mutagenesis kit takes error-prone PCR to the next level by combining mutational spectrums of both our Mutazyme DNA polymerase and Taq DNA polymerase. Sufficient for 30 reactions. | 1kit |
| 200552 | **GeneMorph II EZClone Domain Mutagenesis Kit**<br>This kit features an easy, fast and flexible cloning method so that targeted random mutagenesis can be performed on protein sub-domains and promoter elements. Sufficient for 10 reactions. | 1kit |

## 2.2. XL-1 Red Competent Cells

These competent cells enable a highly efficient, rapid, and reproducible method for introducing random mutations in a cloned gene of interest. This method involves propagating the cloned gene into XL1-Red Competent Cells; an *Escherichia coli*strain which is deficient in three of the primary DNA repair pathways.

- Suitable for generating random mutations within genes lacking selectable or screenable phenotypes
- Does not require extensive genetic or biochemical manipulations

| cat.no | description | unit |
|---|---|---|
| 200129 | **XL1-Red Competent Cells**<br>For random mutagenesis, 1 x $10^6$transformants/µg, includes XL1-Blue competent cells | 5x0,2ml |

# 3. Competent Cells - Difficult Cloning

### 3.1. Large or Ligated DNA

These competent cells offer the highest transformation efficiencies available, enabling dramatically improved transformation efficiencies when cloning large plasmids and ligated DNA. XL10-Gold Ultracompetent Cells possess the high transformation phenotype (Hte), which gives these cells an average transformation efficiency of $\geq 5 \times 10^9$ transformants/µg of supercoiled DNA and makes them ideal for the transformation of large plasmids and ligated DNA. They can also be used for the construction of plasmid libraries as they are able to decrease the size bias against large plasmids and they can produce larger and more complex libraries. ElectroTen-Blue Electroporation-Competent Cells possess the high electroporation efficiency phenotype and have an average transformation efficiency of $\geq 3 \times 10^{10}$transformants/µg of supercoiled DNA.

| cat.no | description | unit |
|---|---|---|
| 200159 | **EletroTen-Blue Electroporation-Competent Cells**<br>Highest electroporation efficiency (Hee) phenotype, use for extrememly demanding cloning, $\geq 3 \times 10^{10}$transformants/µg | 5x0,1ml |
| 200314 | **XL10-Gold Ultracompetent Cells**<br>For extremely demanding cloning, large plasmids and plasmid libraries. Efficiency: $\geq 5 \times 10^9$ transformants/µg pUC18 DNA.<br>Contains: XL10-Gold ultracompetent cells, pUC18 control plasmid, XL10-Gold b-mercaptoethanol mix. | 5x0,1ml |
| 200315 | **XL10-Gold Ultracompetent Cells**<br>For extremely demanding cloning, large plasmids and plasmid libraries. Efficiency: $\geq 5 \times 10^9$ transformants/µg pUC18 DNA<br>Contains: XL10-Gold ultracompetent cells, pUC18 control plasmid, XL10-Gold b-mercaptoethanol mix. | 10x0,1ml |
| 200317 | **XL10-Gold Kanr Ultracompetent Cells**<br>Features the kanamycin-resistance gene on the F' episome, for extremely demanding cloning in chloramphenicol-resistant vectors.<br>Efficiency: $> 5 \times 10^9$ transformants/µg pUC18 DNA. | 10x0,1ml |
| 230247 | **Difficult Cloning Competent Cell Pack**<br>An economical way to solve your difficult cloning experiments. Try each strain with those clones that never seem to work. | 1 pack |

### 3.2. Unstable Clones

Replicating eukaryotic DNA in prokaryotic cells can be problematic. Particular eukaryotic genes may contain inverted repeats or secondary structures, such as Z-DNA, that can be rearranged or deleted by *E. coli* DNA repair systems. The SURE competent cells are deficient in the *E. coli* genes involved in the rearrangement and deletion of DNA, thus improving cloning efficiencies of DNA containing irregular structures in prokaryotic cells. SURE cells are restriction minus (*McrA-*, *McrCB-*, *McrF-*, *Mrr-*, *HsdR-*) endonuclease (*endA*) deficient, and recombination (*recB recJ*) deficient.

- Lack components of the pathways that catalyze the rearrangement and deletion of nonstandard secondary and tertiary structures
- Allows for blue-white color screening

| cat.no | description | unit |
|---|---|---|
| 200152 | **SURE 2 Supercompetent Cells**<br>High-efficiency derivative for cloning DNA with secondary structures, > 1 x $10^9$ transformants/µg | 10x0,1ml |
| 200227 | **SURE Electroporation-Competent Cells**<br>For cloning DNA with secondary structures, ≥1 x $10^{10}$ transformants/µg | 5x0,1ml |
| 200238 | **SURE Competent Cells**<br>For routine cloning of DNA with secondary structures, ≥5 x $10^8$transformants/µg | 5x0,2ml |
| 230247 | **Difficult Cloning Competent Cell Pack**<br>An economical way to solve your difficult cloning experiments. Try each strain with those clones that never seem to work. | 1 pack |

### 3.3. Toxic Clones

The ABLE C strain and the ABLE K strain help solve issues associated with toxic clones. The ABLE C strain reduces the copy number of ColE1-derived plasmids, e.g. pUC and pBluescript, by approximately 4-fold (compared to the XL1-Blue strain) and the ABLE K strain reduces the copy number of these plasmids approximately 10-fold. This decreases the level of cloned protein product, increasing cell viability when proteins are toxic to the cells.

- F' episome allows M13 infection
- Available as chemically and electroporation-competent cells

| cat.no | description | unit |
|---|---|---|
| 200160 | **ABLE Electroporation-Competent Cell Kit**<br>Includes both ABLE C and K cells,<br>Contains: 5 x 0.1 mL ABLE C cells and 5 x 0.1 mL ABLE K cells. | 1 kit |
| 200161 | **ABLE C Electroporation-Competent Cells**<br>Reduces the number of common cloning vectors 4-fold. | 5x0,1ml |
| 200162 | **ABLE K Electroporation-Competent Cells**<br>Reduces the number of common cloning vectors 10-fold. | 5x0,1ml |
| 200170 | **ABLE Competent Cell Kit**<br>Includes both ABLE C and K cells,<br>Contains: 5 x 0.2 mL ABLE C and 5 x 0.2 mL ABLE K cells. | 1 kit |
| 200171 | **ABLE C Competent Cells**<br>Reduces the number of common cloning vectors 4-fold. | 5x0,2ml |
| 200172 | **ABLE K Competent Cells**<br>Reduces copy number of common cloning vectors by 10-fold, allowing toxic clones to replicate. | 5x0,2ml |
| 230247 | **Difficult Cloning Competent Cell Pack**<br>An economical way to solve your difficult cloning experiments. Try each strain with those clones that never seem to work. | 1 pack |

### 3.4. gDNA or Methylated cDNA

When DNA is methylated in a fashion unlike the bacterial host patterns, it is cleaved by the *E. coli* host restriction systems. Cleavage of DNA before host replication creates libraries that lack complete representation. Our MR (Minus Restriction) series of competent cells are deficient in all known *E. coli* K12 restriction systems and make it possible to clone methylated DNA, which can be very useful in epigenetic studies where DNA methylation, instead of changes in DNA sequence, may be associated with heritable changes in gene expression or cellular phenotype.

- XL2-Blue MRF´ Ultracompetent Cells are high-efficiency derivatives of our XL1-Blue MRF´ Supercompetent Cells
- XL1-Blue MRF' Cells are deficient in all known restriction systems and are are endonuclease (*endA*), and recombination (*recA*) deficient
- XL1-Blue MR Cells are restriction minus (*McrA–, McrCB–, McrF–, Mrr, HsdR–*) derivative of our XL1-Blue strain and is useful for cosmid-based cloning

| cat.no | description | unit |
|---|---|---|
| 200138 | **XL1-Blue MRF' Kan Library Pack Competent Cells** | 10µg |
| 200151 | **XL2-Blue MRF' Ultracompetent Cells**<br>Restriction minus for cloning methylated DNA, highest cloning efficiency, > 5 x $10^9$ transformants/µg | 10x0,1ml |
| 200158 | **XL1-Blue MRF' Electroporation-Competent Cells**<br>Restriction minus for cloning methylated DNA, ≥ 1 x $10^{10}$transformants/µg | 5x0,1ml |
| 200229 | **XL1-Blue MR Supercompetent Cells**<br>For use with cloning without the F' episome, ≥ 1 x $10^9$ transformants/µg | 5x0,2ml |
| 200230 | **XL1-Blue MRF' Supercompetent Cells**<br>Restriction minus for cloning methylated DNA, ≥ 1 x $10^9$transformants/µg | 5x0,2ml |
| 200248 | **XL1-Blue MRF' Kan Supercompetent Cells**<br>Large aliquot size for scale-up library transformations, ≥1 x $10^9$transformants/µg | 5x0,2ml |
| 230248 | **Routine Cloning Competent Cell Pack**<br>We have competent cells to fulfill all your cloning needs. This economical competent cell pack lets you optimize your experimental design. | 1 pack |

### 3.5. Phage Display

Electroporation-competent cells capable of producing greater than 1 × $10^{10}$transformants/µg of DNA. These electroporation-ready cells need only be thawed, mixed with DNA, and electroporated. TG1 electroporation-competent cells are recommended for preparation of phage display libraries.

| cat.no | description | unit |
|---|---|---|
| 200123 | **TG1 Electroporation-Competent Cells**<br>For use in phage display library preparation, ≥1 x $10^{10}$transformations/µg | 5x0,1ml |

# 4. Competent Cells – Routine Cloning

## 4.1. General Cloning

The XL1-Blue strains are an all-prupose line of competent cells that are ideal for routine cloning needs. The XL1-Blue strains were designed to provide a host for optimal propagation of both plasmid and lambda phage vectors. They allow for blue-white color screening, single-stranded rescue of phagemid DNA and preparation of high quality plasmid DNA. This strain is available in a wide variety of transformation efficiencies, including XL2-Blue which is a high-efficiency derivative, and in either chemically or electroporation-competent versions.

| cat.no | description | unit |
|---|---|---|
| 200130 | **XL1-Blue Subcloning Grade Competent Cells**<br>For cloning where DNA is not limited, ≥ 1 x $10^6$ transformations/µg | 8x0,5ml |
| 200150 | **XL2-Blue Ultracompetent Cells**<br>Highest cloning efficiency, > 5 x $10^9$ transformants/µg | 10x0,1ml |
| 200228 | **XL1-Blue Electroporation-Competent Cells**<br>For cloning unmethylated DNA, ≥1 x $10^{10}$ transformants/µg | 5x0,1ml |
| 200236 | **XL1-Blue Supercompetent Cells**<br>For high-efficiency cloning, ≥1 x $10^9$ transformants/µg | 5x0,2ml |
| 200249 | **XL1-Blue Competent Cells**<br>For routine cloning, ≥ 1 x $10^8$transformants/µg | 5x0,2ml |
| 230248 | **Routine Cloning Competent Cell Pack**<br>We have competent cells to fulfill all your cloning needs. This economical competent cell pack lets you optimize your experimental design. | 1 pack |

## 4.2. Classic Cell Strains

This collection of competent cells provides customers with classic *E. coli*strains that have been engineered to become competent for use in cloning experiments.

| cat.no | description | unit |
|---|---|---|
| 200231 | **SCSI Supercompetent Cells, 5 x 0.2 mL** 1 x $10^9$ transformants/µg | 5x0,2ml |
| 200232 | **AG1 Competent Cells, 5 x 0.2 mL** 1 x $10^8$ transformants/µg | 5x0,2ml |
| 200233 | **NM522 Competent Cells, 5 x 0.2 mL** 1 x 108 transformants/µg | 5x0,2ml |
| 200234 | **JM101 Competent Cells, 5 x 0.2 mL** 1 x $10^8$ transformants/µg | 5x0,2ml |
| 200235 | **JM109 Competent Cells, 5 x 0.2 mL** 1 x $10^8$ transformants/µg | 5x0,2ml |

## 4.3. Convenient Packaging

High efficiency competent cells in convenient packaging designed to satisfy higher throughput requirements. For ultimate convenience we offer custom configurations, formulations, and packaging options.

- Available in different transformation efficiencies

| cat.no | description | unit |
|---|---|---|
| 200324 | **96 Pack Gold Competent Cells**<br>Tetracycline resistant, Chloramphenicol resistant, Contains: Competent cells in a high-throughput cloning format ≥ 1 x $10^8$ transformants/µg | 4 plates |
| 200325 | **SoloPack Gold Competent Cells**<br>Tetracycline resistant, Chloramphenicol resistant, Contains: Supercompetent cells in a single-reaction format > 1x $10^8$transformants/µg | 15 rxn |
| 200350 | **SoloPack Gold Supercompetent Cells**<br>Tetracycline resistant, Chloramphenicol resistant, Contains: Supercompetent cells in a single-reaction format ≥ 1x $10^9$transformants/µg | 15rxn |

## 4.4. General Unmethylated DNA

Most *E. coli* hosts contain both DNA adenine methylation (*dam*) and DNA cytosine methylation (*dcm*) genes. These genes code for proteins that methylate specific sequences when DNA is propagated, making subsequent digestion with methylation-sensitive restriction enzymes impossible. Agilent offers the SCS110 and JM110 strains, which lack both *dam* and *dcm* activity. DNA propagated in these

strains can be digested by methylation-sensitive enzymes such as *Xba I, Cla I* and *EcoR II*. SCS110 is an *endA*– derivative of the JM110 strain.

| cat.no | description | unit |
|---|---|---|
| 200239 | **JM110 Competent Cells** ≥ 5 x $10^6$ transformants/µg | 5x0,2ml |
| 200247 | **SCS110 Competent Cells** ≥ 5 x $10^6$ transformants/µg | 5x0,2ml |

## 4.5. Random Mutagenesis

These competent cells enable a highly efficient, rapid, and reproducible method for introducing random mutations in a cloned gene of interest. This method involves propagating the cloned gene into XL1-Red Competent Cells; an Escherichia coli

- Suitable for generating random mutations within genes lacking selectable or screenable phenotypes.
- Does not require extensive genetic or biochemical manipulations

| cat.no | description | unit |
|---|---|---|
| 200129 | **XL1-Red Competent Cells**<br>For random mutagenesis, 1 x $10^6$transformants/µg, includes XL1-Blue competent cells | 5x0,2ml |

# 5. Competent Cells Chemicals

## 5.1. X-Gal

For use with cloning systems that utilize β-galactosidase activity as an indicator of successful cloning.

| cat.no | description | unit |
|---|---|---|
| 300201 | **X-Gal. 1gm**<br>Use with cloning systems that use the ß-galactosidase activity as an indicator of nonrecombination. Comes in powder form. | 1g |

## 5.2. IPTG

For use in combination with X-gal to detect β-galactosidase activity in blue/white selection assays.

| cat.no | description | unit |
|---|---|---|
| 300127 | **IPTG**<br>Used in combination with X-gal to detect ß-galactosidase activity with a blue color assay. Comes in powder form. | 1g |

# 5.2. Ampicillin

Amp Tabs Ampicillin Tablets are used to select for ampicillin-resistant bacteria. Turbo Amp Antibiotic is used to reduce satellite colonies when selecting for ampicillin-resistant bacteria.

| cat.no | description | unit |
|---|---|---|
| 300020<br>300021 | **AmpTabs Ampicillin Tablets**<br>Use to select for ampicillin-resistant bacteria | 200x2,5mg<br>200x25mg |
| 300024 | **TurboAmp Antibiotic**<br>Use to reduce satellite colonies when selecting for ampicillin-resistant bacteria. Comes in powder form. | 10g |

# 6. PCR Cloning Kits

## 6.1. StrataClone PCR Cloning Kits

The StrataClone PCR Cloning Kit allows high-efficiency, 5-minute cloning of PCR products at room temperature, using the efficient DNA rejoining activity of DNA topoisomerase I and the DNA recombination activity of Cre recombinase. These kits are available for both blunt-end and UA cloning. Additionally, we have combined the highest accuracy in PCR amplification with easy, reliable, and affordably priced topoisomerase-based cloning in our StrataClone Ultra PCR Cloning System, which includes the *PfuUltra II* Fusion Hotstart DNA Polymerase.

- High efficiency yields >95% insert positive clones
- Clone both long and short amplicons (500 bp – 9.2 Kb) with the same kit
- With Kanamycin and Ampicillin Resistance Markers

| cat.no | description | unit |
|---|---|---|
| 240205 | **StrataClone PCR Cloning Kit**<br>High efficiency UA PCR cloning featuring DNA topoisomerase I and Cre recombinase technologies. Sufficient for 20 reactions. | 1kit |
| 240207 | **StrataClone Blunt PCR Cloning Kit**<br>High efficiency blunt-end PCR cloning, features DNA topoisomerase I and Cre recombinase technologies. Sufficient for 20 reactions. | 1kit |
| 240218 | **StrataClone Ultra Blunt PCR Cloning Kit**<br>High efficiency blunt-end PCR cloning, features DNA topoisomerase I and Cre recombinase technologies. Kit includes *PfuUltra* II for high fidelity PCR amplification. Sufficient for 20 reactions. | 1kit |

## 6.2. PCR Polishing Kits

The PCR Polishing Kit is designed to increase the blunt-ended cloning efficiencies associated with polymerase chain reaction (PCR)-generated fragments.

- Generates blunt-ended DNA fragments in 30 minutes
- More efficient than Klenow polishing

| cat.no | description | unit |
|---|---|---|
| 200409 | **PCR Polishing Kit**<br>Optimizes blunt-end cloning efficiencies of PCR-generated fragments, generates blunt-ended DNA fragments in 30 minutes. Sufficient for 40 reactions. | 1kit |

# 7. PCR Cloning Vectors

## 7.1. pBlueScript II Vectors

The pBluescript II phagemids (plasmids with a phage origin) are cloning vectors designed to simplify commonly used cloning and sequencing procedures, including the construction of nested deletions for DNA sequencing, generation of RNA transcripts *in vitro* and site-specific mutagenesis and gene mapping. The pBluescript II phagemids have an extensive polylinker with 21 unique restriction enzyme recognition sites.

- High copy number ColE1-based phagemid
- Large and versatile polylinker in two orientations; f1 origin available in either (+) or (–) orientation
- T3 and T7 promoters for *in vitro* transcription of RNA

| cat.no | description | unit |
|---|---|---|
| 200252 | **R408 Intereference-Resistant Helper Phage**<br>Stable and easy to grow helper phage (single-strand size ~4 Kb). | 1,0ml |
| 200251 | **VCSM13 Interference-Resistant Helper Phage**<br>Kanamycin-resistant helper phage (single-strand size ~6 Kb) capable high single-stranded phagemid yields. Derivative of M13KO7. | 1,0ml |
| 212205 | **pBluescript II SK(+) Phagemid Kit**<br>f1 origin in (+) orientation, Sac-->Kpn polylinker orientation, Contains: 20 µg pBluescript II SK(+) phagemid vector, Host Strain: XL1-Blue MRF' | 1kit |
| 212206 | **pBluescript II SK(-) Phagemid Kit**<br>f1 origin in (-) orientation, Sac-->Kpn, polylinker orientation, Contains: 20 µg pBluescript II SK(-) phagemid vector, Host Strain: XL1-Blue MRF | 1kit |
| 212207 | **pBluescript II KS(+) Phagemid Kit**<br>f1 origin in (+) orientation, Kpn-->Sac polylinker orientation, Contains: 20 µg pBluescript II KS(+) phagemid vector, Host Strain: XL1-Blue MRF' | 1kit |
| 212208 | **pBluescript II KS(-) Phagemid Kit**<br>f1 origin in (-) orientation, Kpn-->Sac polylinker orientation, Contains: 20 µg pBluescript II KS(-) phagemid vector, Host Strain: XL1-Blue MRF' | 1kit |
| 212240 | **pBluescript II XR Predigested Vector**<br>XR vector is predigested with Xho I and EcoR I | 55rxn |
| 212250 | **pBluescript II RI Predigested Vector**<br>RI vector is predigested with EcoR | 55rxn |

## 7.2. pBC Phagemid Vectors

The pBC vectors were derived from the pBluescript II phagemid. The ampicillin-resistance gene has been replaced with the chloramphenicol resistance gene. pBC phagemids (plasmids with a phage origin) are cloning vectors designed to simplify commonly used cloning and sequencing procedures, including the construction of nested deletions for DNA sequencing, generation of RNA transcripts *in vitro* and site-specific mutagenesis and gene mapping.

- Convenient selection when subcloning from ampicillin-resistant cloning vectors
- Large and versatile polylinker in two orientations for cloning flexibility
- Available with f1 origin in either (+) or (–) orientation

| cat.no | description | unit |
|---|---|---|
| 212215 | **pBC SK(+) Phagemid**<br>f1 origin in (+) orientation, polylinker orientation is Sac-->Kpn | 20µg |
| 212216 | **pBC SK(-) Phagemid**<br>f1 origin in (-) orientation, Polylinker orientation is Sac-->Kpn | 20µg |
| 212217 | **pBC KS(+) Phagemid**<br>f1 origin in (+) orientation, polylinker orientation is Kpn-->Sac | 20µg |
| 212218 | **pBC KS(-) Phagemid**<br>f1 origin in (-) orientation, polylinker orientation is Kpn-->Sac | 20µg |

## 7.3. SuperCos I Vector

SuperCos 1 is a novel, 7.9-kb cosmid vector that contains bacteriophage promoter sequences flanking a unique cloning site. This structure allows rapid synthesis of "walking" probes specific for the extreme ends of insert DNA. The SuperCos 1 vector is also engineered to contain genes for the amplification and expression of cosmid clones in eukaryotic cells.

- Cloning capacity of 30-42 kb
- For generating cosmid libraries
- Ideal for high-resolution restriction mapping and rapid chromosomal walking

| cat.no | description | unit |
|---|---|---|
| 251301 | **SuperCos I Vector Kit**<br>7.9 kb cosmid vector that accepts 30–42 kb inserts. Dual cos sites allow high-efficiency cloning with 1 µg of non-size-selected DNA. Contains: 25 µg SuperCos I vector, 1000 U T3 polymerase, 1000 U T7 polymerase, Host Strain (XL1-Blue MR) | 1kit |

# 8. Cloning Vectors - Lambda 8.

## 8.1. Lambda ZAP II Vector Kits

The Lambda ZAP II vectors combine the high efficiency of lambda vector systems with the versatility of plasmid systems. They enable prokaryotic expression of your gene of interest under control of the *lac* promoter. *In vivo*excision of the Lambda ZAP II vector yields the pBluescript SK- vector, which is a high-copy number pUC-based phagemid.

| cat.no | description | unit |
|---|---|---|
| 200252 | **R408 Intereference-Resistant Helper Phage**<br>Stable and easy to grow helper phage (single-strand size ~4 Kb). | 1,0ml |
| 200251 | **VCSM13 Interference-Resistant Helper Phage**<br>Kanamycin-resistant helper phage (single-strand size ~6 Kb) capable high single-stranded phagemid yields. Derivative of M13KO7. | 1,0ml |
| 211204 | **Rapid Excision Kit**<br>Lambda ZAP and ZAP Express vector excision in less than 10 minutes hands on time, Contains: 1 mL RE704 helper phage (~1 x 108 pfu/mL) XPORT and XLOLR *E. coli strains*. | 1kit |
| 236201 | **Lambda ZAP II Vector Kit**<br>Undigested vector, Contains: 20 µg undigested Lambda ZAP II vector, Excision Plating Strain: SOLR, helper phage: VCSM13, ExAssist helper phage, host strain: XL1-Blue MRF' | 1kit |
| 236211 | **Lambda ZAP II/EcoR I/CIAP Treated Vector**<br>Lambda ZAP II vector predigested with EcoR I, and dephosphorylated to prevent self-ligation. Contains: 10 µg Lambda ZAP II vector, Test instert, Host strain (XL1-Blue MRF'), Helper Phages (VCSM13, ExAssist phage), Excision plating strain (SOLR strain) | 1kit |
| 236612 | **LambdaZAP II/EcoR l/Gigapack III Gold Kit** Cloning kit featuring lambda ZAP II vector provided pre-digested with EcoR I and Gigapack III Gold packaging extract, for the highest efficiency packaging. Contains: Lambda ZAP II EcoR I/CIAP-Treated Vector Kit, 11 vials Gigapack III Gold packaging extract | 1kit |

## 8.2. Lambda ZAP Vector Kits

The ZAP Express and the Lambda ZAP-CMV vectors combine the high efficiency of lambda vector systems with the versatility of plasmid systems. The ZAP Express vectors enable both prokaryotic and eukaryotic expression of your gene of interest. *In vivo* excision of the ZAP Express vector yields the PBK-CMV vector. The *lacZ* promoter drives prokaryotic expression, while the CMV immediate early promoter drives gene expression in mammalian cells. The Lambda ZAP-CMV vector enables high-level eukaryotic expression of your gene of interest. *In vivo* excision of the Lambda ZAP-CMV vector yields the pCMV-Script-EX vector. The CMV immediate early promoter drives gene expression in mammalian cells.

| cat.no | description | unit |
|---|---|---|
| 200253 | **ExAssist Helper Phage w/ SOLR**<br>For mass excision of libraries in Lambda ZAP Vectors, only pBluescript phagemids will grow. | 1ml |
| 211203 | **ExAssist Helper Phage w/ XOLR**<br>For mass excision of libraries in ZAP Express or Lambda ZAP vectors, pCMV-Script or pBluescript phagemid will grow. | 1kit |
| 211204 | **Rapid Excision Kit**<br>Lambda ZAP and ZAP Express vector excision in less than 10 minutes hands on time, Contains: 1 mL RE704 helper phage (~1 x 108 pfu/mL) XPORT and XLOLR E. coli strains. | 1kit |
| 200252 | **R408 Intereference-Resistant Helper Phage**<br>Stable and easy to grow helper phage (single-strand size ~4 Kb). | 1,0ml |
| 200251 | **VCSM13 Interference-Resistant Helper Phage**<br>Kanamycin-resistant helper phage (single-strand size ~6 Kb) capable high single-stranded phagemid yields. Derivative of M13KO7. | 1,0ml |
| 239211 | **ZAP Express EcoR I/CIAP-Treated Vector**<br>ZAP Express vector predigested with EcoR I, and dephosphorylated to prevent self-ligation. Contains: 10 µg predigested ZAP Express Vector, Host Strain (XL1-Blue MRF'), Excision plating strain (XLOLR), Helper phages (R408, ExAssist phage). | 1kit |
| 239212 | **ZAP Express BamH I/CIAP-Treated Vector**<br>ZAP Express vector predigested with BamH I, and dephosphorylated to prevent self-ligation. Contains: 10 µg predigested ZAP Express Vector, Host Strain (XL1-Blue MRF'), Excision plating strain (XLOLR), Helper phages (R408, ExAssist phage). | 1kit |
| 239221 | **Lambda ZAP -CMV RI Cloning Kit**<br>RI vector is predigested with EcoR I, For high-level eukaryotic expression, Contains: 10 µg predigested Lambda ZAP-CMV vector, Test insert, Host strains and helper phage | 1kit |
| 239222 | **Lambda ZAP -CMV XR Cloning Kit**<br>XR vector is predigested with Xho I and EcoR I, For high-level eukaryotic expression, Contains: 10 µg predigested Lambda ZAP-CMV vector, Test insert, Host strains and helper phage | 1kit |
| 239614 | **ZAP Express EcoR II/Gigapack III Vector Kit**<br>Cloning kit featuring the ZAP Express vector provided pre-digested with EcoR I and Gigapack III Gold packaging extract, for the highest efficiency packaging. Contains: ZAP Express EcoR I/CIAP-Treated Vector Kit, 11 vials of Gigapack III Gold packaging extract. | 1kit |
| 239615 | **ZAP Express BamH I/Gigapack III Vector Kit** | 1kit |

| | | |
|---|---|---|
| | Cloning kit featuring the ZAP Express vector provided pre-digested with BamH I and Gigapack III Gold packaging extract, for the highest efficiency packaging. Contains: ZAP Express BamH I/CIAP-Treated Vector Kit, 11 vials of Gigapack III Gold packaging. | |
| 239201 | **ZAP Express Vector Kit**<br>Undigested vector, Contains: 20 µg undigested ZAP Express vector, Excision plating strain: XLOLR, Host Strain: XL1-Blue MRF', Helper Phage: R408, ExAssist helper phage. | 1kit |

### 8.3. Lambda Genomic Vector Kits

Lambda DASH II and Lambda FIX II vectors offer traditional genomic cloning of 9 Kb to 23 Kb fragments. All of our vectors for genomic library construction contain T3 and T7 RNA promoters for rapid gene walking and high-resolution gene mapping.

| cat.no | description | unit |
|---|---|---|
| 248612 | **Xho I/Gigapack III Gold Packaging Extract**<br>Kit contains 10 µg Lambda FIX II Vector predigested with Xho I, 5 µg pMF/BamH I Test Insert, 0.5 ml XL1-Blue MRA Strain, 0.5 ml XL1-Blue MRA (P2) Strain, 11 x 25 µl Gigapack III Gold-11 Packaging Extract, 1.05 µg λcI857 Sam7 wild-type lambda control D | 1kit |
| 247201 | **Lambda DASH II Undigested Vector Kit**<br>Lambda DASH II is a replacement vector used for cloning large fragements of genomic DNA. Kit contains 10 µg Undigested Lambda DASH II DNA, 0.5 ml XL1-Blue MRA Strain, and 0.5 ml XL1-Blue MRA (P2) Strain. | 1kit |
| 241211 | **Lambda EMBL3/BamH I Vector Kit**<br>Double-digested with BamH I and EcoR I, Precipitated to yield BamH I-compatible overhangs, Contains: 10 µg lambda EMBL3 vector, Test insert, Host Strains: XL1-Blue MRA and XL1-Blue MRA(P2) | 1kit |
| 241612 | **Lambda EMBL3/Gigapack III Gold Cloning Kit**<br>Includes Gigapack III Gold packaging extract, Contains: Lambda EMBL3/BamH Vector Kit, 11 vials of Gigapack III Gold packaging extract, Lambda test strain and control host strain | 1kit |
| 247211 | **Lambda DASH II/BamH I Vector Kit**<br>Lambda DASH II vector provided pre-digested with BamH I-compatible overhangs. Contains: 10 µg Lambda DASH II vector, Test insert, Host strains XL1-Blue MRA and XL1-Blue MRA(P2) | 1kit |
| 247212 | **Lambda DASH II/EcoR I Vector Kit**<br>Lambda DASH II vector provided pre-digested with EcoR I-compatible overhangs. Contains: 10 µg Lambda DASH II vector, Test insert, Host strains [XL1-Blue MRA and XL1-Blue MRA(P2)] | 1kit |
| 247713 | **Lambda DASH II/BamHI/Gigapack III X Kit**<br>Cloning kit featuring lambda DASH II vector provided pre-digested with BamH I-compatible overhangs and Gigapack III XL packaging extract, for preferential packaging of phage with large inserts. Contains: Lambda DASH II/BamH I Vector Kit, 11 vials of 11 vials of Gigapack III Gold packaging extract, Gigapack controls | 1kit |
| 247714 | **Lambda DASH II/EcoRI/Gigapack III XL Kit**<br>Cloning kit featuring lambda DASH II vector provided pre-digested with | 1kit |

| | | |
|---|---|---|
| | EcoR I-compatible overhangs and Gigapack III XL packaging extract, for preferential packaging of phage with large inserts. Contains: Lambda DASH II/EcoR I Vector Kit, 11 vials of 25ul Gigapack III XL extract. | |
| 248211 | **Lambda FIX II/Xho I Partial Fill-in Vector**<br>Lambda FIX II vector, pre-digested with Xho I, then filled in with dCTP and dTTP. Accepts 9—23 kb genomic DNA inserts that are partial digested with Mbo I, BamH I, Bgl II or Sau3A I and then filled in with dGTP and dATP. Contains: 10 µg Lambda FIX II | 1kit |
| 248712 | **Lambda FIX II/Gigapack III XL Cloning Kit**<br>Cloning kit featuring the lambda FIX II vector, pre-digested with Xho I, then filled in with dCTP and dTTP. Accepts 9—23 kb genomic DNA inserts that are partial digested with Mbo I, BamH I, Bgl II or Sau3A I and then filled in with dGTP and dATP. Including 11 vilas of 25ul Gigapaxk III XL-11 packaging extract. | 1kit |

## 8.4. Lambda gt11 Vector Kits

For use in the construction of cDNA libraries. These Lambda gt11 vector kits do not allow *in vivo* excision of cloned fragments. Libraries may be screened with both antibodies and nucleic acid probes.

- Predigested with EcoR I
- >1 x $10^7$ pfu/µg lambda DNA must be obtained with test insert (background <1.5%)

| cat.no | description | unit |
|---|---|---|
| 234211 | **Lambda gt11/EcoR I/CIAP Treated Vector Kit**<br>Vector arms dephosphorylated with alkaline phosphatase to prevent self-ligation, Contains: 10 µg lambda gt11/EcoR I/CIAP-treated vector, Host Strains: Y1088, Y1089r-, Y1090r-, Test insert | 1kit |
| 234612 | **Lambda gt11/EcoR l/Gigapack III Gold Kit**<br>Includes Gigapack III Gold packaging extract, Lambda gt11/EcoR I/CIAP-treated Vector Kit, 11 vials Gigapack III Gold packaging extract | 1kit |

# 9. Library Packaging 9.

### 9.1. Gigapack III Packaging Extracts

The single-tube format of Gigapack III packaging extract simplifies the packaging procedure and increases the efficiency and representation of libraries constructed from highly methylated DNA. The ability of Gigapack III packaging extracts to preserve methylated DNA makes it ideal for use in epigenetic studies where DNA methylation may be associated with heritable changes in gene expression or cellular phenotype. Each packaging extract is restriction minus to optimize packaging efficiency and library representation.

- Highest efficiency available (2 x $10^9$ pfu/µg)
- Absence of restriction activity prevents degradation of methylated DNA
- Increases library representation

| cat.no | description | unit |
|---|---|---|
| 200201<br>200202<br>200203 | **Gigapack III Gold Packaging Extract, 4 Rxn**<br>Packaging efficiency: 2 x $10^9$ pfu/µg. Higest efficiency available, for cDNA and genomic libraries Contains: Gigapack III Gold packaging extract, control lambda DNA and control host strain. | 4rxn<br>7rxn<br>11rxn |
| 200204<br>200205<br>200206 | **Gigapack III Plus Packaging Extract, 4 Rxn**<br>Packaging efficiency: 1 x $10^9$ pfu/µg. For cDNA and genomic libraries Contains: Gigapack III Plus packaging extract, control lambda DNA and control host strain. | 4rxn<br>7rxn<br>11rxn |
| 200207<br>200208<br>200209 | **Gigapack III XL Packaging Extract, 4 Rxn**<br>Packaging efficiency: 1 x $10^9$ pfu/µg. Preferentially packages phage with large inserts; For genomic lambda and cosmid libraries Contains: Gigapack III XL packaging extract, control lambda DNA and control host strain. | 4rxn<br>7rxn<br>11rxn |

# 10. Cloning Libraries

## 10.1. MageMan Human Transcriptome Library

The MegaMan human transcriptome library is a collection of cDNA created using mRNA from 66 diverse sources, including 32 from human tissues and 34 from human cancer cell lines. This human transcriptome library is ideal for cloning both well-characterized genes and transcripts previously identified by expressed sequence tag (EST) studies.

- Comprehensive collection of the human transcriptome in a single tube
- Enriched for full-length cDNA sequences from 66 different human mRNA sources
- Primary clones preserves rarer sequences

| cat.no | description | unit |
|---|---|---|
| 790000<br>790001 | **MegaMan Human Transcriptome Library, 20 Rxn**<br>The MegaMan Human Transcriptome Library is the most comprehensive source of the human transcriptome in a single tube, which allows for quick and easy cloning of rare genes without RNA isolation or cDNA synthesis. | 20rxn<br>100rxn |

# 11. Ladders, Markers, Restriction Enzymes

## 11.1. Restriction Enzymes

*Dpn* I is an ideal enzyme for cloning and Southern blot analysis

- High purity enzyme preparation
- Includes 10X universal reaction buffer

| cat.no | description | unit |
|---|---|---|
| 500402 | ***Dpn* I Restriction Enzyme, 200 U .** | 200U |

## 11.2. Glogos II Autorad markers

Luminescent peel-off stickers used for accurately marking and aligning autoradiographs. Easily affixed to plastic wrap or paper, these convenient markers emit low-level luminescence rather than radioactivity, making the Glogos II markers a safe, non-hazardous alternative to radioactive ink.

- Adaptable for long or short exposures

| cat.no | description | unit |
|---|---|---|
| 420201 | **Glogos II Autorad Markers, x markers** | 100 markers |
| 420202 | Luminescent peel-off stickers for marking and aligning autoradiographs. | 300 markers |
| 420203 | Convenient, nonhazardous alternative to messy radioactive ink | 1000markers |

# 12. Modifying Enzymes - Ligation

## 12.1. DNA Ligation

The DNA Ligation Kit includes T4 DNA ligase for highly efficient ligations. The kit is optimized for use with our lambda arms and plasmid vectors.

- For both sticky-end and blunt-end ligations
- Reagents guaranteed to be DNase free while providing optimal ligation efficiency
- Includes a plasmid control and a lambda control

| cat.no | description | unit |
|---|---|---|
| 203003 | **DNA Ligation Kit**<br>Kit Contains: T4 DNA ligase (300 U) 10X Ligase Buffer Plasmid control Lambda control 10mM rATP<. Sufficient fro 150 reactions./p> | 1kit |

## 12.2. Pfu DNA Ligase

*Pfu* DNA ligase is a recombinant enzyme derived from *Pyrococcus furiosus*hyperthermophilic marine archaebacterium that catalyzes linkage of adjacent 5'-phosphate and 3'-hydroxy ends of double-stranded DNA at 45° to 80°C, with a temperature optimum near 70°C for nick-sealing reactions. It has higher ligation specificity and lower background than Tth DNA ligase.

- Highly thermostable, with half-life of over 60 minutes at 95°C
- Increases reliability of LCR by permitting higher melt temperatures
- Eliminates LCR template-predenaturation step, less enzyme required for LCR

| cat.no | description | unit |
|---|---|---|
| 600191 | **Pfu DNA Ligase, 400U**<br>Kit contains: 400 U Pfu DNA Ligase 10X reaction buffer | 400U |

## 12.2. T4 DNA Ligase

T4 DNA ligase is used to ligate cohesive ends in an overnight reaction. It catalyzes the linkage of adjacent 5'-phosphate and 3'-hydroxy ends of double-stranded DNA by formation of a phosphodiester bond.

- High efficiency at joining fragments with complementary sticky ends

| cat.no | description | unit |
|---|---|---|
| 600011 | **T4 DNA Ligase, 300 U**<br>Kit contains: 300 U T4 DNA ligase Reaction Buffer | 300U |

# 13. Modifying Enzymes – General & Polymerases

## 13.1. Klenow

The Klenow Fill-In Kit provides the components needed to perform partial fill-in reactions to prepare genomic DNA for insertion into the Lambda FIX II vector. This kit can also be used to perform a complete fill-in of a 5′ overhang to generate blunt ends, which can be directly ligated. Additionally, the kit can be used to radioactively end label a 5′ overhang with [alpha-$^{32}$P]dNTP.

- Includes predigested DNA that can be used as a control

| cat.no | description | unit |
|---|---|---|
| 600069 | **Exo-Klenow** Exonuclease-deficient | 125U |
| 200410 | **Klenow Fill-In Kit**<br>Contains: Klenow fragment (125 U), dNTPs (separate 10 mM stocks), Klenow reaction buffer, Control DNA. Sufficient for 25 reactions. | 1kit |

## 13.2. Proteinase K

Proteinase K is a broad spectrum protease from *Tritirachium album* that is ideal for preparing chromosomal DNA for use in the following applications: pulsed field electrophoresis, chromosomal DNA for protein fingerprinting, and nuclease removal from DNA and RNA preparations. It cleaves peptide bonds in which carbonyl groups are surrounded by aromatic, hydrophobic, or aliphatic amino acids

- For general digestion of protein in biological samples
- Lyophilized powder with specific activity >30 units/mg at 37°C

| cat.no | description | unit |
|---|---|---|
| 300140<br>300141 | **Proteinase K, 100 mg**<br>Lyophilized powder with specific activity >30 units/mg at 37°C | 100mg<br>500mg |

## 13.3. Singles-stranded DNA Binding Protein

The single-stranded DNA binding protein is a helix-destabilizing *E. coli* protein which is essential for replication, recombination, and repair processes. This 75.6-kD protein consists of four identical monomers and selectively binds single-stranded DNA.

- Facilitates sequencing and site-directed mutagenesis reactions

| cat.no | description | unit |
|---|---|---|
| 600201 | **Single-Stranded DNA Binding Protein,100 µg** . | 100 µg |

## 13.4. SP6 RNA Polymerase

SP6 RNA Polymerase is a DNA-dependent RNA polymerase with a high sequence specificity for SP6 promoter sequences. SP6 RNA polymerase synthesizes RNA 5' to 3' and incorporates $^{35}S$, $^{32}P$ and $^{33}P$ ribonucleotides. This enzyme is isolated from an overproducing recombinant *E. coli* clone.

- Probes for nucleic acid hybridizations
- Templates for *in vitro* translation
- Substrates for RNA processing studies
- Exon and intron mapping of genomic DNA

| cat.no | description | unit |
|---|---|---|
| 600151 | **SP6 RNA Polymerase**<br>Contains: Reaction and dilution buffers, Concentration is 50 units/µL | 3000U |

## 13.5. T3 & T7 Polymerases

Proteinase K is a broad spectrum protease from *Tritirachium album* that is ideal for preparing chromosomal DNA for use in the following applications: pulsed field electrophoresis, chromosomal DNA for protein fingerprinting, and nuclease removal from DNA and RNA preparations. It cleaves peptide bonds in which carbonyl groups are surrounded by aromatic, hydrophobic, or aliphatic amino acids

- For general digestion of protein in biological samples
- Lyophilized powder with specific activity >30 units/mg at 37°C

| cat.no | description | unit |
|---|---|---|
| 600111 | **T3 RNA Polymerase** High sequence specifity for T3 promoters | 5000U |
| 600123<br>600124 | **T7 RNA Polymerase** High sequence specifity for T7 promoters | 5000U<br>25000U |

# 14. Modifying Enzymes – RNase & DNase 14.

## 14.1. RNace-IT Ribonuclease Cocktail

RNace-IT ribonuclease cocktail is a mixture of two RNases: RNase A and a nonspecific RNase from *Aspergillus oryzae* known as RNase T1. The combined action of these ribonucleases results in the degradation of RNA into small oligoribonucleotides.

- Tested to be free of contaminating DNase activity

| cat.no | description | unit |
|---|---|---|
| 400720 | **RNace-It Ribonuclease Cocktail**Contains: RNase A (2 mg/mL), nonspecific RNase from*Aspergillus oryzae* (4 units/µL) | 6000U |

## 14.2. RNase Block Ribonuclease Inhibitor

RNase Block Ribonuclease Inhibitor is a 50-kDa protein that specifically inhibits common eukaryotic RNases including RNase A, RNase B, and RNase C. It is a recombinant ribonuclease inhibitor derived by a molecular cloning technology that inactivates RNases by binding noncovalently to the RNase molecule.

- Only 25 to 40 U is required for a standard transcription reaction

| cat.no | description | unit |
|---|---|---|
| 300151<br>300152 | **RNase Block** Recombinant ribonuclease inhibitor | 4000U<br>16000U |

## 14.3. DNase I, RNase Free

Dnase I, Rnase Free catalyzes the degradation of double-stranded DNA into oligonucleotides 1,2 and mononucleotides. This enzyme has been isolated as a mixture of four isoenzymes from bovine pancreas that cut preferentially next to pyrimidine nucleotides.

- Produces no noticeable RNA degradation

| cat.no | description | unit |
|---|---|---|
| 600031<br>600032 | **RNase Free DNase I**<br>Contains: Mixture of four isoenzymes from bovine pancreas (10 units/µL) | 1000U<br>5000U |

# Next Generation Cloning

# SureVector

## Kit Ordering Guide

SureVector, the world's first modular vector system, harnesses the power of synthetic biology to provide quick, user-friendly customization of cloning and expression vectors. SureVector kits contain a unique set of optimized parts that can be assembled into an endless array of custom vectors – all with a validated assembly system you can count on.

| Kit Number | Name | Description | Species | Markers | Origins of Replication | XP1 Fragments | XP2 Fragments | Promoters | Tags | Promoter-Tag Fusions |
|---|---|---|---|---|---|---|---|---|---|---|
| G7514A | Core Kit | Core Kit | *E. coli*, Mammalian, Yeast | Amp, Kan, Cam | pUC, p15A, pBR322 | XP1, yARS | XP2, NeoR, LEU2, LacI | none | none | T7-His, CMV-His, GAL1-His |
| G7518A | *E. coli* Bacterial Selection Kit | Starter Kit | *E. coli* | Amp, Kan, Cam | pUC | XP1 | LacI | none | none | T7-His |
| G7515A | *E. coli* N-terminal Expansion Kit | Promoters + N-term tags | *E. coli* | none | none | none | none | T7, Tac, Rhamnose | CBP, DsbA, GST, 6xHis, MBP, SBP | none |
| G7515B | *E. coli* C-terminal Expansion Kit | Promoters + C-term tags | *E. coli* | none | none | none | none | T7, Tac, Rhamnose | CBP, HA, 6xHis, c-Myc, SBP, Thioredoxin, | none |
| G7518B | *E. coli* N-terminal Promoter Kit | 3 promoters + N-term His tag | *E. coli* | Amp | pUC | XP1 | LacI | T7, Tac | 6xHis | T7-HIS6 |
| G7518C | *E. coli* C-terminal Promoter Kit | 3 promoters + C-term His tag | *E. coli* | Amp | pUC | XP1 | LacI | T7, Tac, Rhamnose | 6xHis | none |
| G7518D | *E. coli* N-terminal Tag Kit | 3 N-term tags + T7 promoter | *E. coli* | Amp | pUC | XP1 | LacI | T7 | GST, MBP, SBP | T7-His |
| G7518E | *E. coli* C-terminal Tag Kit | 3 C-term tags + T7 promoter | *E. coli* | Amp | pUC | XP1 | LacI | T7 | CBP, SBP, Thioredoxin | none |
| G7516A | Mammalian N-terminal Expansion Kit | 3 promoters + N-term tags | Mammalian | none | none | none | Blasticidin, Hygromycin, Puromycin | CMV, EF1a, SV40 | 3xFLAG, GFP, 3xHA, 6xHis, c-Myc, SBP | none |
| G7516B | Mammalian C-terminal Expansion Kit | 3 promoters + C-term tags | Mammalian | none | none | none | Blasticidin, Hygromycin, Puromycin | CMV, EF1a, SV40 | 3xFLAG, GFP, 3xHA, 6xHis, c-Myc, SBP | none |
| G7517A | Yeast N-terminal Expansion Kit | 3 promoters + N-term tags | Yeast | none | none | none | URA3, HIS3, Hygromycin | GAL1, CUP1, ADH1 | 3xFLAG, GFP, 3xHA, 6xHis, c-Myc, SBP | none |
| G7517B | Yeast C-terminal Expansion Kit | 3 promoters + C-term tags | Yeast | none | none | none | URA3, HIS3, Hygromycin | GAL1, CUP1, ADH1 | 3xFLAG, GFP, 3xHA, 6xHis, c-Myc, SBP | none |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