Biomatik
Tel: (519) 489-7195, (800) 836-8089
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Free Standard Vectors

Version 3.3, Revision 2011-08-28

Biomatik provides a few standard vectors for subcloning, free of charge: **1) pBMH; 2) pBME; 3) pBluescript II SK (+); 4) pUC19; 5) pUC18; 6) pUC57.**

We can also subclone your gene into any other vector of your choice. If you wish to use any specific vector other than our free standard vectors, we will be happy to do it at an additional cost.

→ pBMH or pBME vectors are excellent choices for standard cloning. Our specialists highly recommend pBMH or pBME vector for your gene synthesis projects. By using either vector under our platform, any gene synthesis project is likely to save at least 4 days in turnaround time.

pBMH / pBME Vector

pBMH vector is ~2.9kb bp in length, created by removing almost all commonly used restriction sites from the multiple cloning sites (MCS) of the commercial cloning vector pBluescript II SK(+), leaving only one SmaI (CCC*GGG) site and one EcoRV (GAT*ATC) site for blunt end cloning and two HindIII (AAGCTT) sites for gene digestion screening.

pBMH vector is excellent choice for subcloning, as it minimizes the unexpected fragments which show up along with the target DNA fragment. Any kind of DNA fragments can be inserted into the vector via Blunt end cloning or TA cloning. All the unique restriction sites in the gene will still be unique in the final construct.

The structure of pBMH vector is very similar to that of pBluescript II SK (+) except for the multiple cloning sites (MCS). Similar to pBluescript II SK (+), pBMH vector is designed for DNA cloning, DNA sequencing, *in vitro* mutagenesis and *in vitro* transcription in a single system.

Features include: (1) *f1* (*IG*) - the intergenic region of phage f1; (2) *rep (pMB1)* - the *pMB1* replicon responsible for the replication of phagemid. DNA replication initiates at position 1213 (+/- 1) and proceeds in the same direction of pBluescript II SK (+); (3) *bla* (ApR) - gene, coding for beta-lactamase that confers ampicillin resistance. (4) *lacZ* - 5'-terminal part of *lacZ* gene encoding the N-terminal fragment of beta-galactosidase. This fragment allows blue/white screening.

General blunt-end cloning strategy using pBMH vector:

1. Using SmaI (CCC*GGG) or EcoRV (GAT*ATC) site, linearize the pBMH vector;
2. Dephosphorylate the ends of linearized vector (by alkaline phosphatase (AP) treatment) to prevent self re-circularization of the vector during ligation
3. Perform ligation, transformation and screening according to standard laboratory protocols

Antibiotic resistance: Ampicillin
Standard sequencing primers: M13(+) / M13(-)

If gene is inserted into the linearized pBMH vector, the SmaI or EcoRV site will be destroyed, and will not be present in the final construct.

pBME is identical to pBMH except that the MCS region of pBME has two EcoR1 sites while pBMH has 2 HindIII sites.

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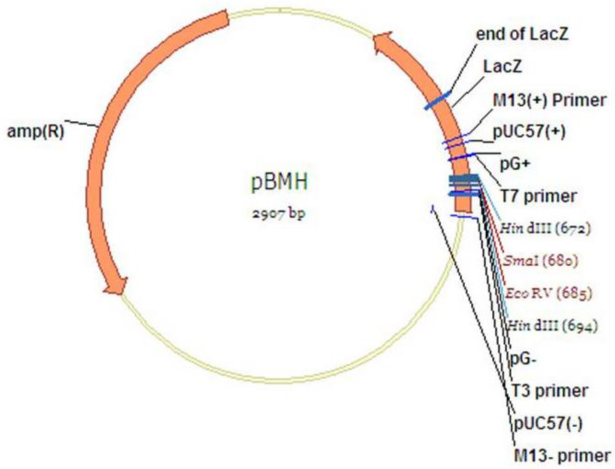

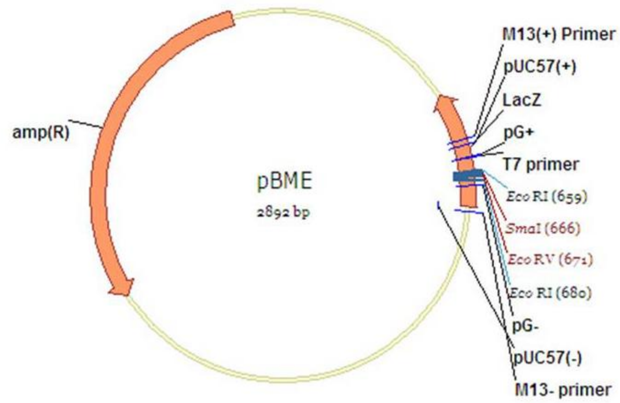

Cloning Sites

HindIII SmaI EcoRV HindIII

GGC CGT CAA GGC CAA GCT TCC CGG GAT ATC ACG TGA AGC TTG CAA GCT CCA GCT
CCG GCA GTT CCG GTT CGA AGG GCC CTA TAG TGC ACT TCG AAC GTT CGA GGT CGA

Cloning Sites

EcoRI SmaI EcoRV EcoRI

GGG CGA ATT GGG TAC GAA TTC CCG GGA TAT CAC GTG GAA TTC CAA GCT CCA GCT
CCC GCT TAA CCC ATG CTT AAG GGC CCT ATA GTG CTC CTT AAG GTT CGA GGT CGA

VECTOR SEQUENCE: (pBMH)

(Note: Highlighted sequence represents the MCS)

1 CTAAATTGTA AGCGTTAATA TTTTGTTAAA ATTCGCGTTA AATTTTTGTT AAATCAGCTC
61 ATTTTTTAAC CAATAGGCCG AAATCGGCAA AATCCCTTAT AAATCAAAAG AATAGACCGA
121 GATAGGGTTG AGTGTTGTTC CAGTTTGGAA CAAGAGTCCA CTATTAAAGA ACGTGGACTC
181 CAACGTCAAA GGGCGAAAAA CCGTCTATCA GGGCGATGGC CCACTACGTG AACCATCACC
241 CTAATCAAGT TTTTTGGGGT CGAGGTGCCG TAAAGCACTA AATCGGAACC CTAAAGGGAG
301 CCCCCGATTT AGAGCTTGAC GGGGAAAGCC GGCGAACGTG GCGAGAAAGG AAGGGAAGAA
361 AGCGAAAGGA GCGGGCGCTA GGGCGCTGGC AAGTGTAGCG GTCACGCTGC GCGTAACCAC
421 CACACCCGCC GCGCTTAATG CGCCGCTACA GGGCGCGTCC CATTCGCCAT TCAGGCTGCG
481 CAACTGTTGG GAAGGGCGAT CGGTGCGGGC CTCTTCGCTA TTACGCCAGC TGGCGAAAGG
541 GGGATGTGCT GCAAGGCGAT TAAGTTGGGT AACGCCAGGG TTTTCCCAGT CACGACGTTG
601 TAAAACGACG GCCAGTGAGC GCGCGTAATA CGACTCACTA TAGGGCGAAT TGGGTACGGC
661 CGTCAAGGCC AAGCTT**CCCG GGATATC**ACG TGAAGCTTGC AAGCTCCAGC TTTTGTTCCC
721 TTTAGTGAGG GTTAATTGCG CGCTTGGCGT AATCATGGTC ATAGCTGTTT CCTGTGTGAA
781 ATTGTTATCC GCTCACAATT CCACACAACA TACGAGCCGG AAGCATAAAG TGTAAAGCCT
841 GGGGTGCCTA ATGAGTGAGC TAACTCACAT TAATTGCGTT GCGCTCACTG CCCGCTTTCC
901 AGTCGGGAAA CCTGTCGTGC CAGCTGCATT AATGAATCGG CCAACGCGCG GGGAGAGGCG
961 GTTTGCGTAT TGGGCGCTCT TCCGCTTCCT CGCTCACTGA CTCGCTGCGC TCGGTCGTTC
1021 GGCTGCGGCG AGCGGTATCA GCTCACTCAA AGGCGGTAAT ACGGTTATCC ACAGAATCAG
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1141 AGGCCGCGTT GCTGGCGTTT TTCCATAGGC TCCGCCCCCC TGACGAGCAT CACAAAAATC
1201 GACGCTCAAG TCAGAGGTGG CGAAACCCGA CAGGACTATA AAGATACCAG GCGTTTCCCC
1261 CTGGAAGCTC CCTCGTGCGC TCTCCTGTTC CGACCCTGCC GCTTACCGGA TACCTGTCCG
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1381 CGGTGTAGGT CGTTCGCTCC AAGCTGGGCT GTGTGCACGA ACCCCCCGTT CAGCCCGACC
1441 GCTGCGCCTT ATCCGGTAAC TATCGTCTTG AGTCCAACCC GGTAAGACAC GACTTATCGC
1501 CACTGGCAGC AGCCACTGGT AACAGGATTA GCAGAGCGAG GTATGTAGGC GGTGCTACAG
1561 AGTTCTTGAA GTGGTGGCCT AACTACGGCT ACACTAGAAG GACAGTATTT GGTATCTGCG
1621 CTCTGCTGAA GCCAGTTACC TTCGGAAAAA GAGTTGGTAG CTCTTGATCC GGCAAACAAA
1681 CCACCGCTGG TAGCGGTGGT TTTTTTGTTT GCAAGCAGCA GATTACGCGC AGAAAAAAAG

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1741 GATCTCAAGA AGATCCTTTG ATCTTTTCTA CGGGGTCTGA CGCTCAGTGG AACGAAAACT
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1981 TTGCCTGACT CCCCGTCGTG TAGATAACTA CGATACGGGA GGGCTTACCA TCTGGCCCCA
2041 GTGCTGCAAT GATACCGCGA GATCCACGCT CACCGGCTCC AGATTTATCA GCAATAAACC
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2401 TGGTTATGGC AGCACTGCAT AATTCTCTTA CTGTCATGCC ATCCGTAAGA TGCTTTTCTG
2461 TGACTGGTGA GTACTCAACC AAGTCATTCT GAGAATAGTG TATGCGGCGA CCGAGTTGCT
2521 CTTGCCCGGC GTCAATACGG GATAATACCG CGCCACATAG CAGAACTTTA AAAGTGCTCA
2581 TCATTGGAAA ACGTTCTTCG GGGCGAAAAC TCTCAAGGAT CTTACCGCTG TTGAGATCCA
2641 GTTCGATGTA ACCCACTCGT GCACCCAACT GATCTTCAGC ATCTTTTACT TTCACCAGCG
2701 TTTCTGGGTG AGCAAAAACA GGAAGGCAAA ATGCCGCAAA AAAGGGAATA AGGGCGACAC
2761 GGAAATGTTG AATACTCATA CTCTTCCTTT TTCAATATTA TTGAAGCATT TATCAGGGTT
2821 ATTGTCTCAT GAGCGGATAC ATATTTGAAT GTATTTAGAA AAATAAACAA ATAGGGGTTC
2881 CGCGCACATT TCCCCGAAAA GTGCCAC
```

Restriction Enzymes - Single/Double cutters:

Name	Frequency	Positions / Cut-site
AclI	2	2217/2219, 2590/2592
AcyI	1	2528/2530
AflIII	1	1099/1100
AloI	1	169/194
AlwNI	1	1510/1516
ApaLI	2	1413/1414, 2659/2660
ApoI	2	29/30, 40/41
AvaI	1	677/678
BaeI	1	653
BcgI	1	2508/2532
BciVI	2	1308, 2835
BfiI	2	585, 2037
BsaAI	2	225/228, 687/690
BsaXI	2	171/192, 952
BsePI	2	619/620, 738/739
BseSI	2	1413/1418, 2659/2664
BseYI	1	1403
BsiI	2	1272, 2656
BsmAI	1	2824/2830
Bsp24I	2	1601/1625, 1779/1803
BspHI	2	1819/1820, 2827/2828
BspLU11I	1	1099/1100
BsrDI	2	2046/2054, 2228
BtgZI	1	213/229
Cfr10I	2	328/329, 2072/2073
CspCI	1	2904
CstMI	2	366/392, 2345

Name	Frequency	Positions / Cut-site
DraIII	1	222/228
DrdI	2	176/183, 1201/1208
Eco57I	2	1626/1648, 2674
EcoRV	1	682/685
GsuI	2	704, 2077
HaeIV	1	1987/2012
HgiJII	1	298/303
Hin4I	2	1987/2011, 2061/2085
HindIII	2	671/672, 693/694
MstI	2	477/480, 2212/2215
NaeI	1	328/331
NspI	1	1099/1104
PmaCI	1	687/690
PsiI	1	97/100
PvuI	2	497/501, 2359/2363
PvuII	2	527/530, 921/924
RsaI	2	654/656, 2471/2473
SapI	1	976/984
ScaI	1	2470/2473
SexAI	1	1477
SfiI	1	658/666
SmaI	1	677/680
SspI	2	17/20, 2794/2797
TatI	1	2470/2471
TspGWI	2	2759/2775, 2442
XmaIII	1	657/658
XmnI	1	2587/2592

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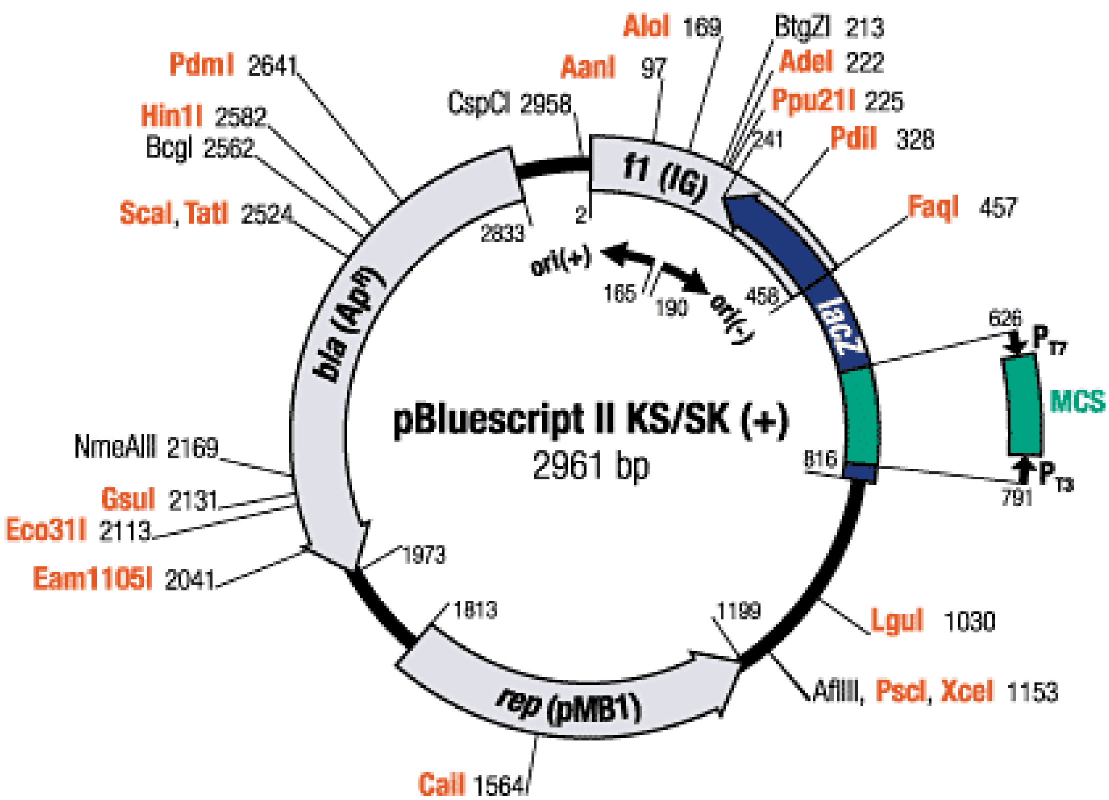
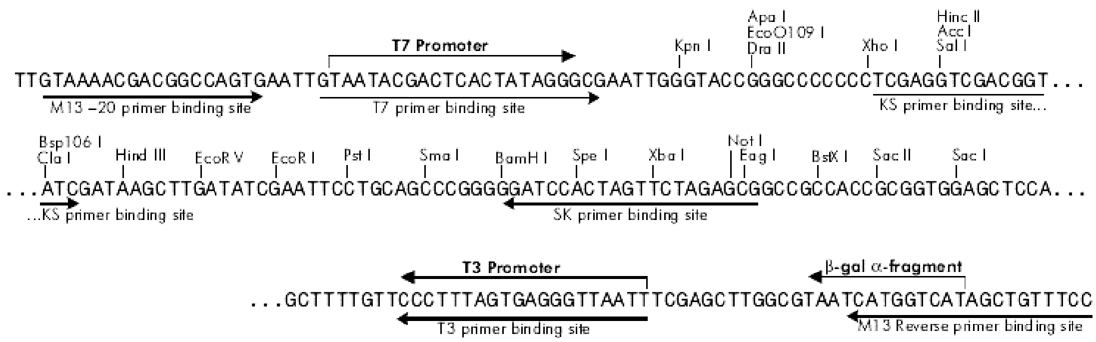
Non-Cutting Enzymes:

AarI	AatII	AccI	AflII	AgeI	AlfI	ApaI	ApaBI	AscI	AsuII	AvrII	BalI	BamHI	BbvII	BbvCI
BglII	BplI	Bpu10I	BsaBI	BseRI	BsgI	BsmI	Bsp1407I	BspMI	BspMII	BstEII	BstXI	BtrI	ClaI	DraII
Eco31I	Eco47III	EcoNI	EcoRI	EspI	Esp3I	FalI	FseI	FspAI	HindII	HpaI	KpnI	MfeI	MluI	NarI
NcoI	NdeI	NheI	NotI	NruI	PacI	PasI	PflMI	PfoI	PmeI	PpuMI	PshAI	PspXI	PsrI	PstI
RsrII	SacI	SacII	SalI	SanDI	SauI	SgfI	SgrAI	SnaBI	SpeI	SphI	SplI	SrfI	Sse232I	Sse8387I
StuI	StyI	SwaI	TaqII	Tth111I	XbaI	XcmI	XhoI	I-CeuI	PI-SceI	BclI	DsaI	RleAI	OliI	Sse8647I

pBluescript II SK(+) Vector



Multiple cloning sites:



Vector Sequence:

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 121 GATAGGGTTG AGTGTTGTTC CAGTTTGGAA CAAGAGTCCA CTATTAAAGA ACGTGGACTC
 181 CAACGTCAAA GGGCGAAAAA CCGTCTATCA GGGCGATGGC CCACTACGTG AACCATCACC
 241 CTAATCAAGT TTTTTGGGGT CGAGGTGCCG TAAAGCACTA AATCGGAACC CTAAAGGGAG
 301 CCCCCGATTT AGAGCTTGAC GGGGAAAGCC GGCGAACGTG GCGAGAAAGG AAGGGAAGAA
 361 AGCGAAAGGA GCGGGCGCTA GGGCGCTGGC AAGTGTAGCG GTCACGCTGC GCGTAACCAC
 421 CACACCCGCC GCGCTTAATG CGCCGCTACA GGGCGCGTCC CATTCGCCAT TCAGGCTGCG
 481 CAACTGTTGG GAAGGGCGAT CGGTGCGGGC CTCTTCGCTA TTACGCCAGC TGGCGAAAGG
 541 GGGATGTGCT GCAAGGCGAT TAAGTTGGGT AACGCCAGGG TTTTCCCAGT CACGACGTTG
 601 TAAAACGACG GCCAGTGAGC GCGCGTAATA CGACTCACTA TAGGGCGAAT TGGGTACCGG
 661 GCCCCCCCTC GAGGTCGACG GTATCGATAA GCTTGATATC GAATTCCTGC AGCCCGGGGG
 721 ATCCACTAGT TCTAGAGCGG CCGCCACCGC GGTGGAGCTC CAGCTTTTGT TCCCTTTAGT
 781 GAGGGTTAAT TGCGCGCTTG GCGTAATCAT GGTCATAGCT GTTTCCTGTG TGAAATTGTT
 841 ATCCGCTCAC AATTCCACAC AACATACGAG CCGGAAGCAT AAAGTGTAAA GCCTGGGGTG
 901 CCTAATGAGT GAGCTAACTC ACATTAATTG CGTTGCGCTC ACTGCCCGCT TTCCAGTCGG
 961 GAAACCTGTC GTGCCAGCTG CATTAATGAA TCGGCCAACG CGCGGGGAGA GGCGGTTTGC
1021 GTATTGGGCG CTCTTCCGCT TCCTCGCTCA CTGACTCGCT GCGCTCGGTC GTTCGGCTGC
1081 GGCGAGCGGT ATCAGCTCAC TCAAAGGCGG TAATACGGTT ATCCACAGAA TCAGGGGATA
1141 ACGCAGGAAA GAACATGTGA GCAAAAGGCC AGCAAAAGGC CAGGAACCGT AAAAAGGCCG
1201 CGTTGCTGGC GTTTTTCCAT AGGCTCCGCC CCCCTGACGA GCATCACAAA AATCGACGCT
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1381 TCCCTTCGGG AAGCGTGGCG CTTTCTCATA GCTCACGCTG TAGGTATCTC AGTTCGGTGT
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1861 AAGGGATTTT GGTCATGAGA TTATCAAAAA GGATCTTCAC CTAGATCCTT TTAAATTAAA
1921 AATGAAGTTT TAAATCAATC TAAAGTATAT ATGAGTAAAC TTGGTCTGAC AGTTACCAAT
1981 GCTTAATCAG TGAGGCACCT ATCTCAGCGA TCTGTCTATT TCGTTCATCC ATAGTTGCCT
2041 GACTCCCCGT CGTGTAGATA ACTACGATAC GGGAGGGCTT ACCATCTGGC CCCAGTGCTG
2101 CAATGATACC GCGAGACCCA CGCTCACCGG CTCCAGATTT ATCAGCAATA AACCAGCCAG
2161 CCGGAAGGGC CGAGCGCAGA AGTGGTCCTG CAACTTTATC CGCCTCCATC CAGTCTATTA
2221 ATTGTTGCCG GGAAGCTAGA GTAAGTAGTT CGCCAGTTAA TAGTTTGCGC AACGTTGTTG
2281 CCATTGCTAC AGGCATCGTG GTGTCACGCT CGTCGTTTGG TATGGCTTCA TTCAGCTCCG
2341 GTTCCCAACG ATCAAGGCGA GTTACATGAT CCCCCATGTT GTGCAAAAAA GCGGTTAGCT
2401 CCTTCGGTCC TCCGATCGTT GTCAGAAGTA AGTTGGCCGC AGTGTTATCA CTCATGGTTA
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2941 CATTTCCCCG AAAAGTGCCA C
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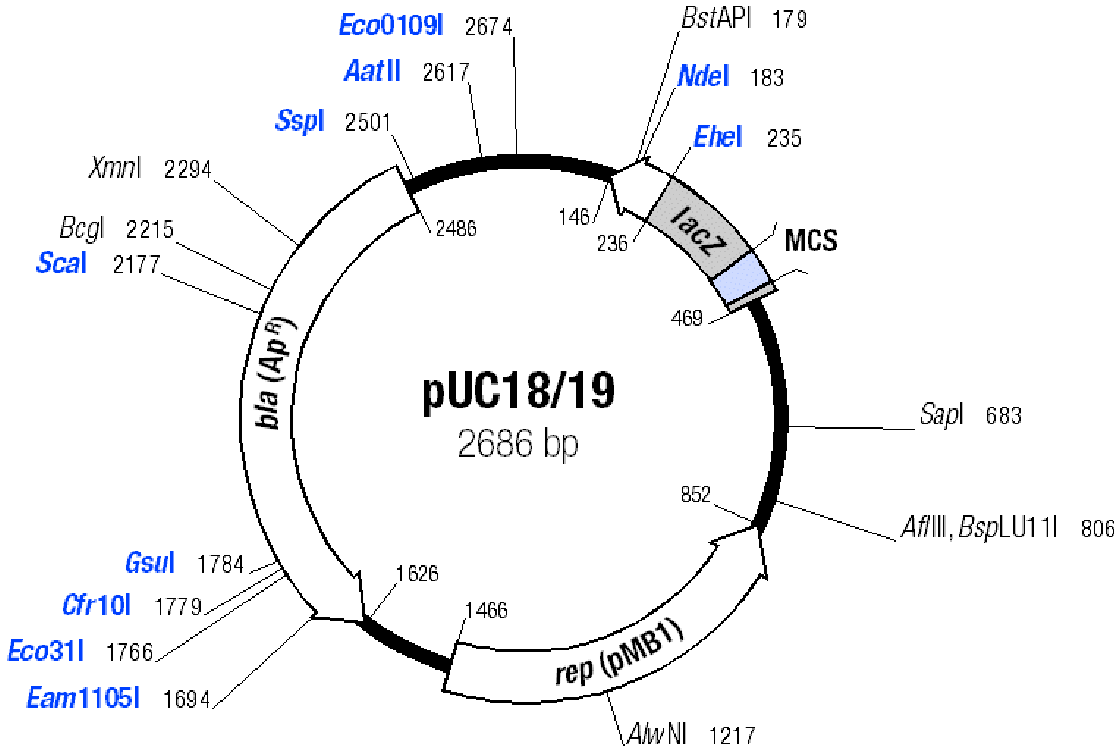
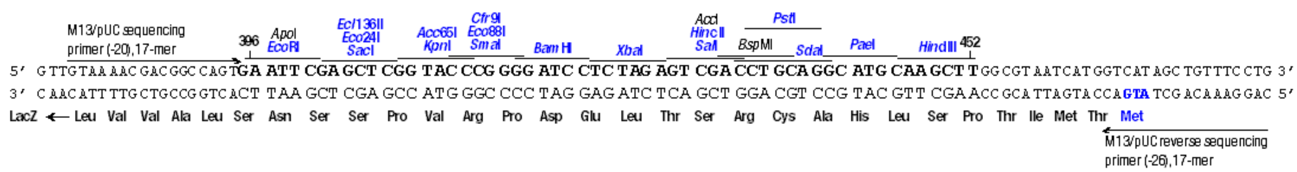
PUC 19 / 18 Vector

PUC19 is a small, high-copy number *E. coli* plasmid cloning vector containing portions of pBR322 and M13mp19. It contains the pMB1 origin of replication from pBR322, but it lacks the *rop* gene and carries a point mutation in the RNAII transcript (G 2975 in pBR322 to A 1308 in pUC19). These changes together result in a temperature-dependent copy number of about 75 per cell at 37°C and >200 per cell at 42°C. The multiple cloning site (MCS) is in frame with the *lacZ*α gene, allowing screening for insertions using α-complementation.

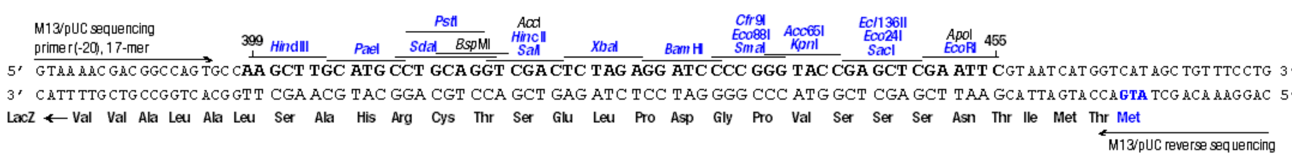
PUC18 is identical to pUC19 except that the MCS region (nt 397-454) is inverted.



pUC19



pUC18



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Vector Sequence:

```
   1 GCGCCCAATA CGCAAACCGC CTCTCCCCGC GCGTTGGCCG ATTCATTAAT GCAGCTGGCA
  61 CGACAGGTTT CCCGACTGGA AAGCGGGCAG TGAGCGCAAC GCAATTAATG TGAGTTAGCT
 121 CACTCATTAG GCACCCCAGG CTTTACACTT TATGCTTCCG GCTCGTATGT TGTGTGGAAT
 181 TGTGAGCGGA TAACAATTTC ACACAGGAAA CAGCTATGAC CATGATTACG CCAAGCTTGC
 241 ATGCCTGCAG GTCGACTCTA GAGGATCCCC GGGTACCGAG CTCGAATTCA CTGGCCGTCG
 301 TTTTACAACG TCGTGACTGG GAAAACCCTG GCGTTACCCA ACTTAATCGC CTTGCAGCAC
 361 ATCCCCCTTT CGCCAGCTGG CGTAATAGCG AAGAGGCCCG CACCGATCGC CCTTCCCAAC
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 481 GCGGTATTTC ACACCGCATA TGGTGCACTC TCAGTACAAT CTGCTCTGAT GCCGCATAGT
 541 TAAGCCAGCC CCGACACCCG CCAACACCCG CTGACGCGCC CTGACGGGCT TGTCTGCTCC
 601 CGGCATCCGC TTACAGACAA GCTGTGACCG TCTCCGGGAG CTGCATGTGT CAGAGGTTTT
 661 CACCGTCATC ACCGAAACGC GCGAGACGAA AGGGCCTCGT GATACGCCTA TTTTTATAGG
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 901 TCCGTGTCGC CCTTATTCCC TTTTTTGCGG CATTTTGCCT TCCTGTTTTT GCTCACCCAG
 961 AAACGCTGGT GAAAGTAAAA GATGCTGAAG ATCAGTTGGG TGCACGAGTG GGTTACATCG
1021 AACTGGATCT CAACAGCGGT AAGATCCTTG AGAGTTTTCG CCCCGAAGAA CGTTTTCCAA
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1861 GTGAGTTTTC GTTCCACTGA GCGTCAGACC CCGTAGAAAA GATCAAAGGA TCTTCTTGAG
1921 ATCCTTTTTT TCTGCGCGTA ATCTGCTGCT TGCAAACAAA AAAACCACCG CTACCAGCGG
1981 TGGTTTGTTT GCCGGATCAA GAGCTACCAA CTCTTTTTCC GAAGGTAACT GGCTTCAGCA
2041 GAGCGCAGAT ACCAAATACT GTTCTTCTAG TGTAGCCGTA GTTAGGCCAC CACTTCAAGA
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2341 AGGCGGACAG GTATCCGGTA AGCGGCAGGG TCGGAACAGG AGAGCGCACG AGGGAGCTTC
2401 CAGGGGGAAA CGCCTGGTAT CTTTATAGTC CTGTCGGGTT TCGCCACCTC TGACTTGAGC
2461 GTCGATTTTT GTGATGCTCG TCAGGGGGGC GGAGCCTATG GAAAAACGCC AGCAACGCGG
2521 CCTTTTTACG GTTCCTGGCC TTTTGCTGGC CTTTTGCTCA CATGTTCTTT CCTGCGTTAT
2581 CCCCTGATTC TGTGGATAAC CGTATTACCG CCTTTGAGTG AGCTGATACC GCTCGCCGCA
2641 GCCGAACGAC CGAGCGCAGC GAGTCAGTGA GCGAGGAAGC GGAAGA
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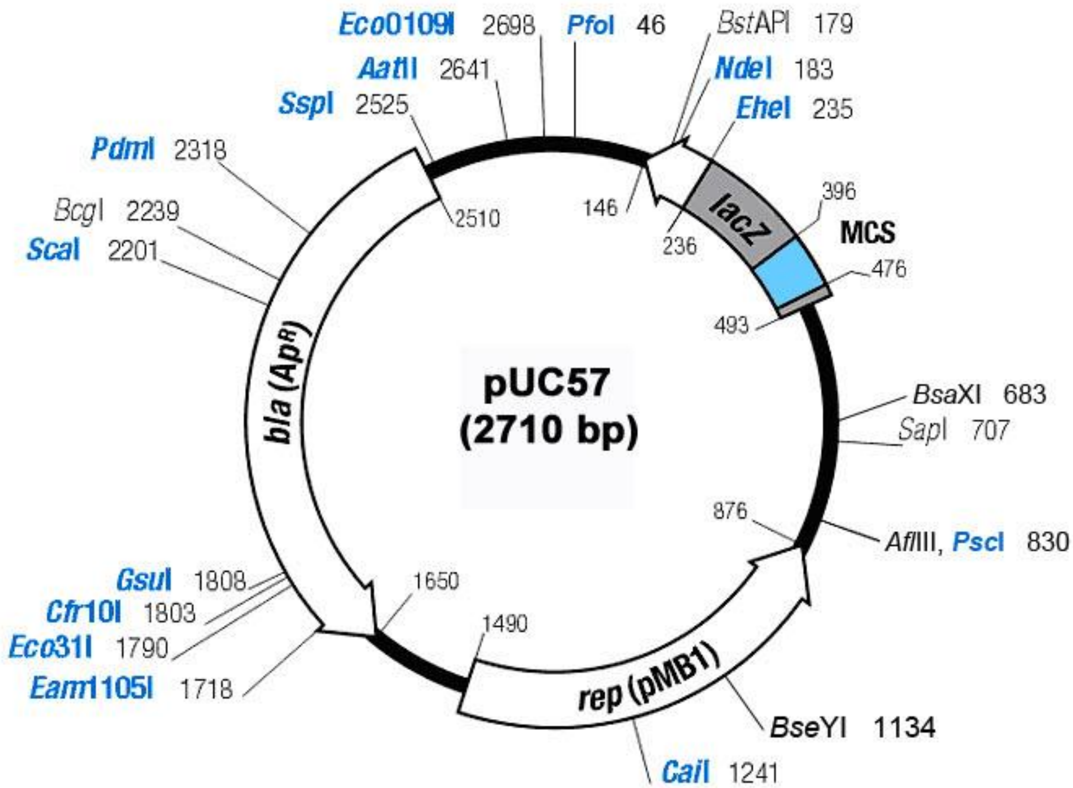
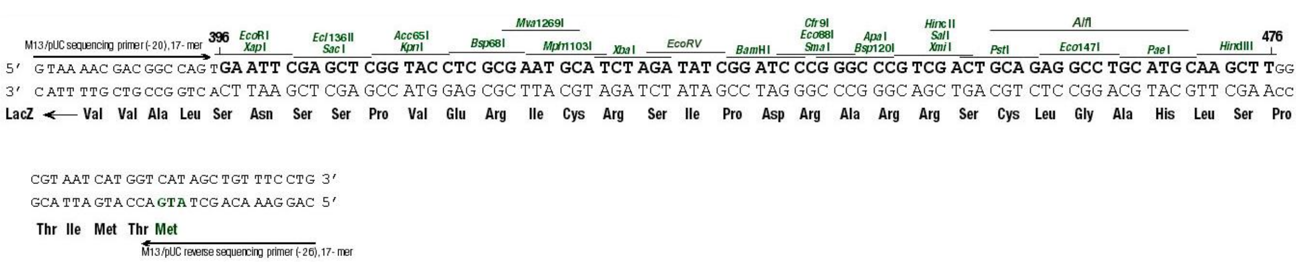
Free Standard Vectors

Version 3.3, Revision 2011-08-28

PUC 57 Vector

pUC57 is a derivative of pUC19 plasmid. pUC57 MCS contains 6 restriction sites with 3' sticky ends, which are resistant to E.coli exonuclease III. The exact position of genetic elements is shown on the map (termination codons included). DNA replication initiates at position 890 (+/-1) and proceeds in indicated direction. The *bla* gene coding for beta-lactamase confers ampicillin resistance.





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Vector Sequence:

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   1 TCGCGCGTTT CGGTGATGAC GGTGAAAACC TCTGACACAT GCAGCTCCCG GAGACGGTCA
  61 CAGCTTGTCT GTAAGCGGAT GCCGGGAGCA GACAAGCCCG TCAGGGCGCG TCAGCGGGTG
 121 TTGGCGGGTG TCGGGGCTGG CTTAACTATG CGGCATCAGA GCAGATTGTA CTGAGAGTGC
 181 ACCATATGCG GTGTGAAATA CCGCACAGAT GCGTAAGGAG AAAATACCGC ATCAGGCGCC
 241 ATTCGCCATT CAGGCTGCGC AACTGTTGGG AAGGGCGATC GGTGCGGGCC TCTTCGCTAT
 301 TACGCCAGCT GGCGAAAGGG GGATGTGCTG CAAGGCGATT AAGTTGGGTA ACGCCAGGGT
 361 TTTCCCAGTC ACGACGTTGT AAAACGACGG CCAGTGAATT CGAGCTCGGT ACCTCGCGAA
 421 TGCATCTAGA TATCGGATCC CGGGCCCGTC GACTGCAGAG GCCTGCATGC AAGCTTGGCG
 481 TAATCATGGT CATAGCTGTT TCCTGTGTGA AATTGTTATC CGCTCACAAT TCCACACAAC
 541 ATACGAGCCG GAAGCATAAA GTGTAAAGCC TGGGGTGCCT AATGAGTGAG CTAACTCACA
 601 TTAATTGCGT TGCGCTCACT GCCCGCTTTC CAGTCGGGAA ACCTGTCGTG CCAGCTGCAT
 661 TAATGAATCG GCCAACGCGC GGGGAGAGGC GGTTTGCGTA TTGGGCGCTC TTCCGCTTCC
 721 TCGCTCACTG ACTCGCTGCG CTCGGTCGTT CGGCTGCGGC GAGCGGTATC AGCTCACTCA
 781 AAGGCGGTAA TACGGTTATC CACAGAATCA GGGGATAACG CAGGAAAGAA CATGTGAGCA
 841 AAAGGCCAGC AAAAGGCCAG GAACCGTAAA AAGGCCGCGT TGCTGGCGTT TTTCCATAGG
 901 CTCCGCCCCC CTGACGAGCA TCACAAAAAT CGACGCTCAA GTCAGAGGTG GCGAAACCCG
 961 ACAGGACTAT AAAGATACCA GGCGTTTCCC CCTGGAAGCT CCCTCGTGCG CTCTCCTGTT
1021 CCGACCCTGC CGCTTACCGG ATACCTGTCC GCCTTTCTCC CTTCGGGAAG CGTGGCGCTT
1081 TCTCATAGCT CACGCTGTAG GTATCTCAGT TCGGTGTAGG TCGTTCGCTC CAAGCTGGGC
1141 TGTGTGCACG AACCCCCCGT TCAGCCCGAC CGCTGCGCCT TATCCGGTAA CTATCGTCTT
1201 GAGTCCAACC CGGTAAGACA CGACTTATCG CCACTGGCAG CAGCCACTGG TAACAGGATT
1261 AGCAGAGCGA GGTATGTAGG CGGTGCTACA GAGTTCTTGA AGTGGTGGCC TAACTACGGC
1321 TACACTAGAA GAACAGTATT TGGTATCTGC GCTCTGCTGA AGCCAGTTAC CTTCGGAAAA
1381 AGAGTTGGTA GCTCTTGATC CGGCAAACAA ACCACCGCTG GTAGCGGTGG TTTTTTTGTT
1441 TGCAAGCAGC AGATTACGCG CAGAAAAAAA GGATCTCAAG AAGATCCTTT GATCTTTTCT
1501 ACGGGGTCTG ACGCTCAGTG GAACGAAAAC TCACGTTAAG GGATTTTGGT CATGAGATTA
1561 TCAAAAAGGA TCTTCACCTA GATCCTTTTA AATTAAAAAT GAAGTTTTAA ATCAATCTAA
1621 AGTATATATG AGTAAACTTG GTCTGACAGT TACCAATGCT TAATCAGTGA GGCACCTATC
1681 TCAGCGATCT GTCTATTTCG TTCATCCATA GTTGCCTGAC TCCCCGTCGT GTAGATAACT
1741 ACGATACGGG AGGGCTTACC ATCTGGCCCC AGTGCTGCAA TGATACCGCG AGACCCACGC
1801 TCACCGGCTC CAGATTTATC AGCAATAAAC CAGCCAGCCG GAAGGGCCGA GCGCAGAAGT
1861 GGTCCTGCAA CTTTATCCGC CTCCATCCAG TCTATTAATT GTTGCCGGGA AGCTAGAGTA
1921 AGTAGTTCGC CAGTTAATAG TTTGCGCAAC GTTGTTGCCA TTGCTACAGG CATCGTGGTG
1981 TCACGCTCGT CGTTTGGTAT GGCTTCATTC AGCTCCGGTT CCCAACGATC AAGGCGAGTT
2041 ACATGATCCC CCATGTTGTG CAAAAAAGCG GTTAGCTCCT TCGGTCCTCC GATCGTTGTC
2101 AGAAGTAAGT TGGCCGCAGT GTTATCACTC ATGGTTATGG CAGCACTGCA TAATTCTCTT
2161 ACTGTCATGC CATCCGTAAG ATGCTTTTCT GTGACTGGTG AGTACTCAAC CAAGTCATTC
2221 TGAGAATAGT GTATGCGGCG ACCGAGTTGC TCTTGCCCGG CGTCAATACG GGATAATACC
2281 GCGCCACATA GCAGAACTTT AAAAGTGCTC ATCATTGGAA AACGTTCTTC GGGGCGAAAA
2341 CTCTCAAGGA TCTTACCGCT GTTGAGATCC AGTTCGATGT AACCCACTCG TGCACCCAAC
2401 TGATCTTCAG CATCTTTTAC TTTCACCAGC GTTTCTGGGT GAGCAAAAAC AGGAAGGCAA
2461 AATGCCGCAA AAAAGGGAAT AAGGGCGACA CGGAAATGTT GAATACTCAT ACTCTTCCTT
2521 TTTCAATATT ATTGAAGCAT TTATCAGGGT TATTGTCTCA TGAGCGGATA CATATTTGAA
2581 TGTATTTAGA AAAATAAACA AATAGGGGTT CCGCGCACAT TTCCCCGAAA AGTGCCACCT
2641 GACGTCTAAG AAACCATTAT TATCATGACA TTAACCTATA AAAATAGGCG TATCACGAGG
2701 CCCTTTCGTC
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Note: *The sequences given in this document has been compiled using information from published sequences and other sources as well as from partial sequences obtained by Biomatik. The vector has not been sequenced completely by Biomatik.*