



GenScript

Make Research Easy

LISTA DE VETORES DE EXPRESSÃO

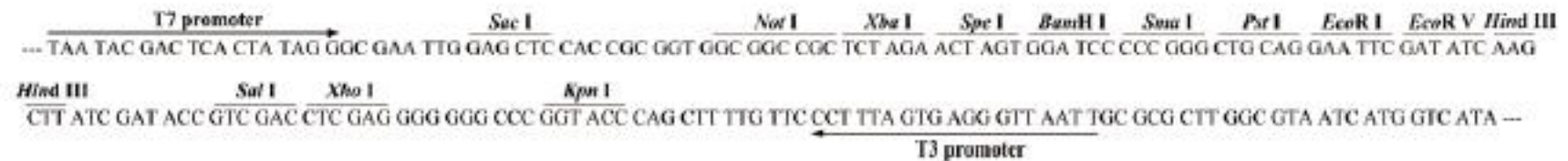
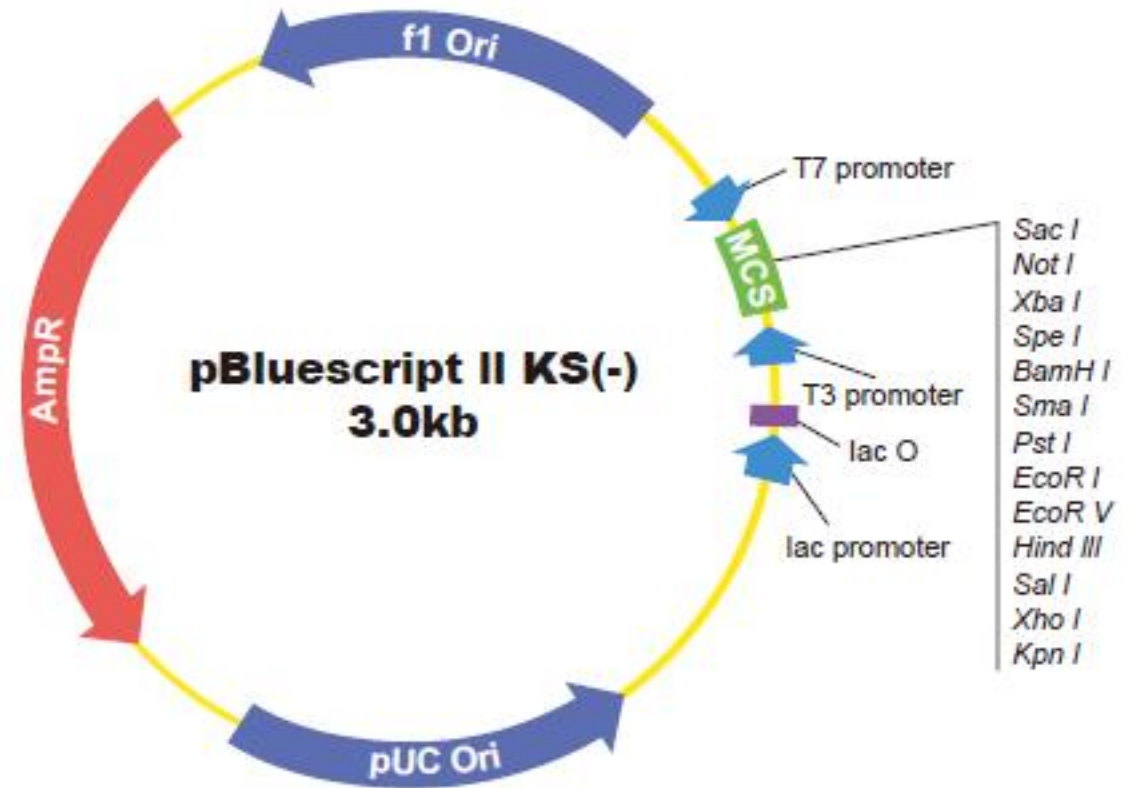
Vetores para expressão em bactérias.

VETORES DE EXPRESSÃO EM BACTÉRIA

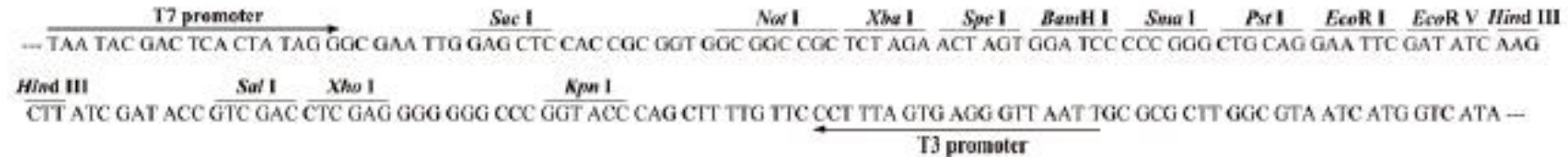
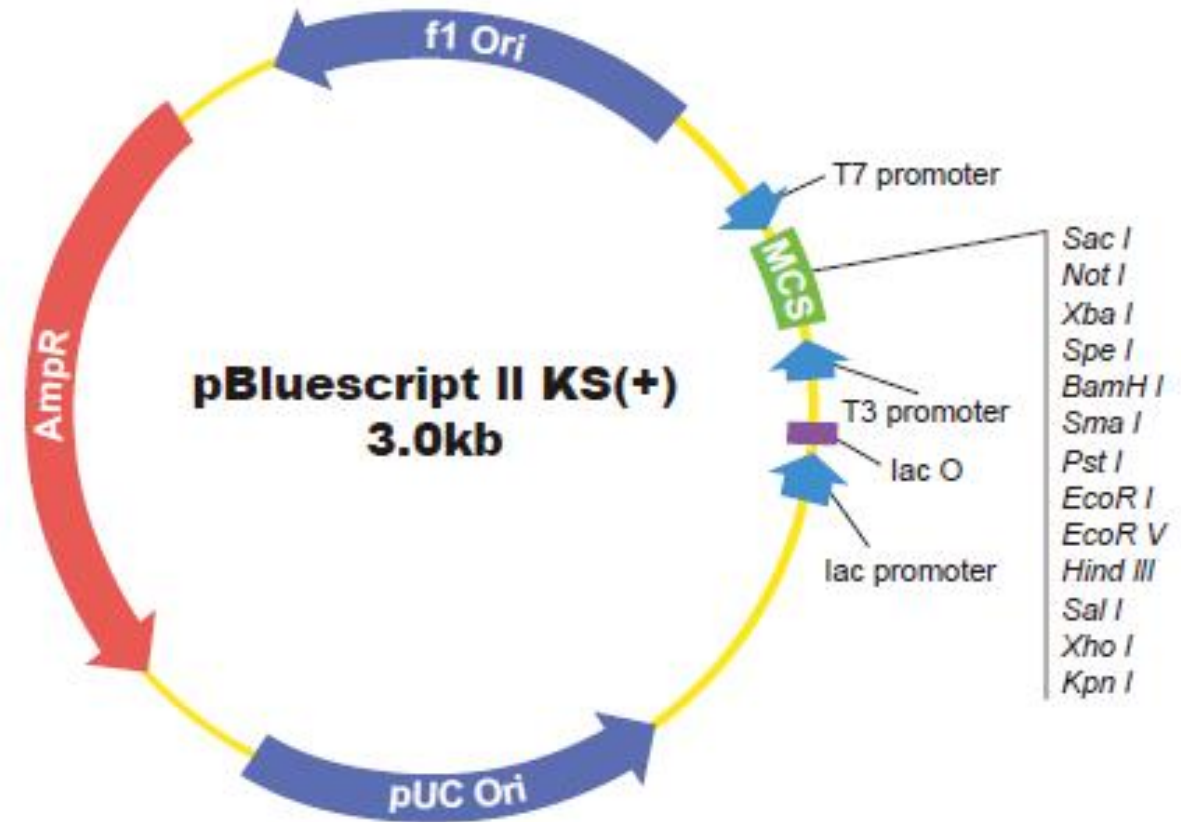
pBluescript II KS(-)	pET-9a	pET-17b	pET-24a(+)	pET-28a(+)
pBluescript II KS(+)	pET-11a	pET-19b	pET-24a(+)-TEV	pET-28a(+)-TEV
pBluescript II SK(-)	pET-11b	pET-20b(+)	pET-24b(+)	pET-28b(+)
pBluescript II SK(+)	pET-11c	pET-21a(+)	pET-24c(+)	pET-28c(+)
pET-3a	pET-11d	pET-21b(+)	pET-24d(+)	pET-29a(+)
pET-3b	pET-14b	pET-21d(+)	pET-25b(+)	pET-29b(+)
pET-3c	pET-15b	pET-22b(+)	pET-26b(+)	pET-29c(+)
pET-3d	pET-16b	pET-23a(+)	pET-27b(+)	pET-30a(+)

pET-30b(+)	pET-42a(+)	pET-52b(+)	pGEX-6P-1	pMAL-p5X	pGEX-4T-1-H(RBS)
pET-30c(+)	pET-42b(+)	pGEX-2TK	pGEX-6P-2	pQE-1	pGEX-4T-1-M(RBS)
pET-31b(+)	pET-42c(+)	pGEX-4T-1	pGEX-6P-3	pQE-60	pGEX-5X-1-H(RBS)
pET-32a(+)	pET-43.1a(+)	pGEX-4T-2	pMAL-c4x	pGS-21a	pGEX-5X-1-M(RBS)
pET-32b(+)	pET-43.1b(+)	pGEX-4T-3	pMAL-c5E	pETDuet-1	pGEX-6P-1-H(RBS)
pET-41a(+)	pET-45b(+)	pGEX-5X-1	pMAL-c5x	pCDFDuet-1	pGEX-6P-1-M(RBS)
pET-41b(+)	pET-50b(+)	pGEX-5X-2	pMAL-p5E	pRSFDuet-1	pMAL-c4x-1-H(RBS)
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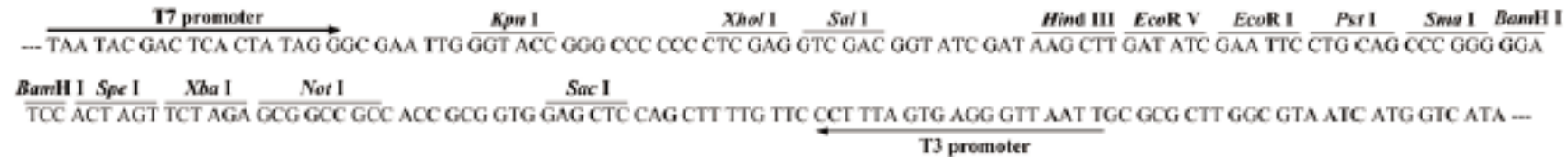
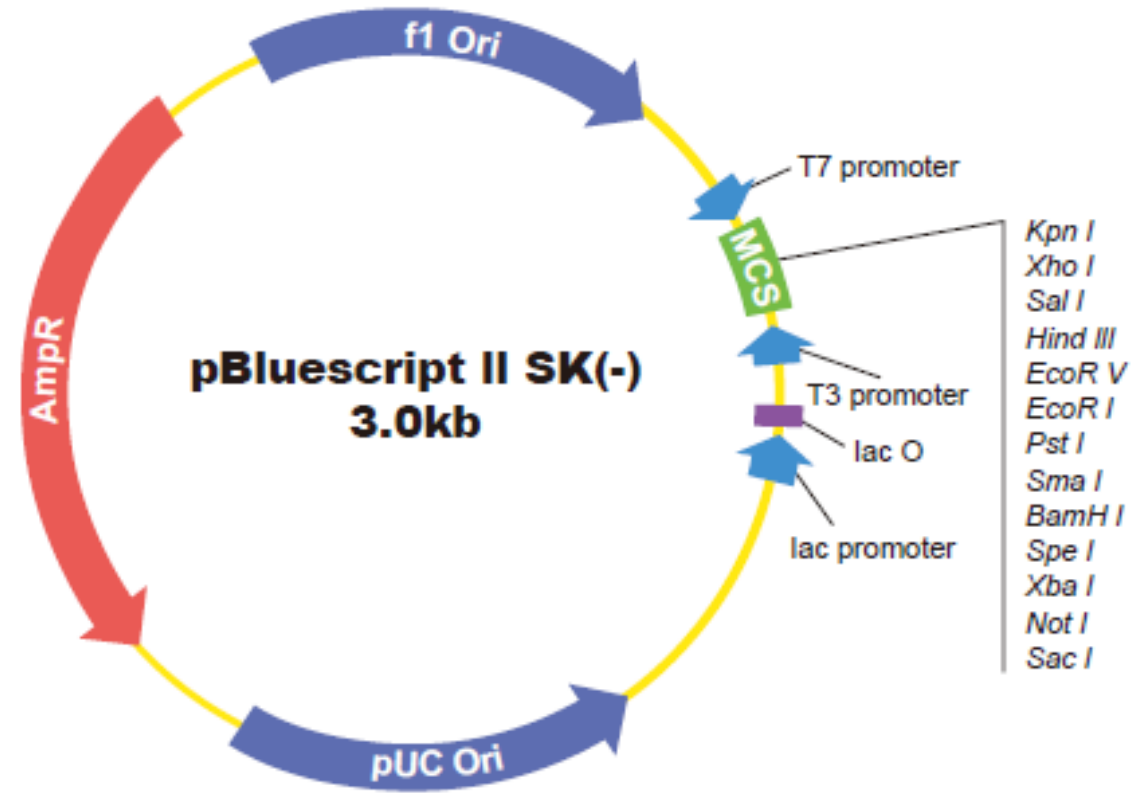
pBluescript II KS(-)



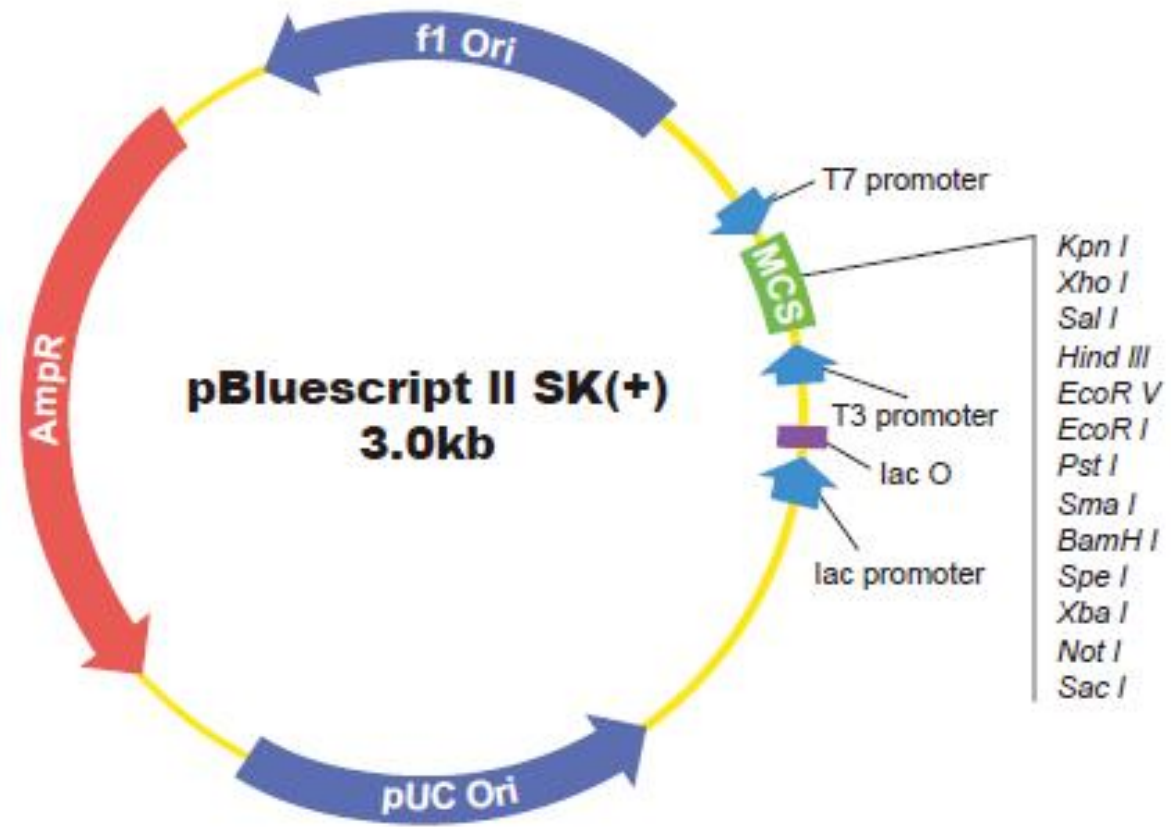
pBluescript II KS(+)



pBluescript II SK(-)

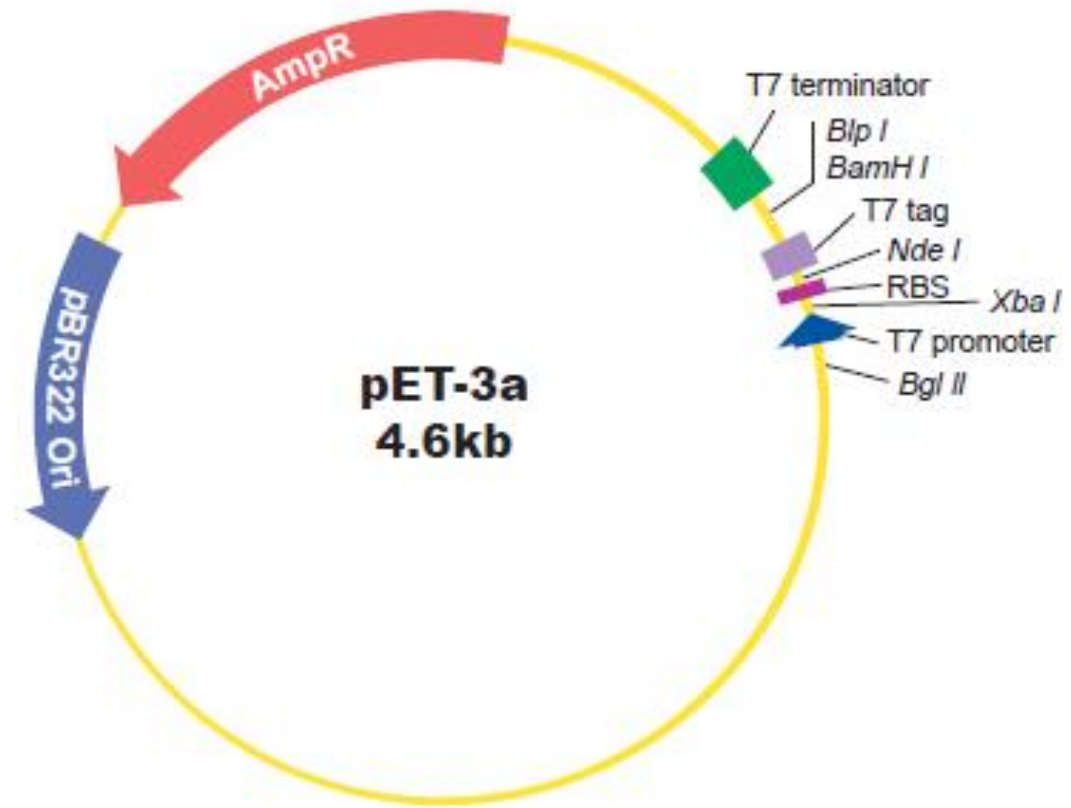


pBluescript II SK(+)



T7 promoter →
 --- TAA TAC GAC TCA CTA TAG GGC GAA TTG GGT ACC GGG CCC CCC CTC GAG GTC GAC GGT ATC GAT AAG CTT GAT ATC GAA TTC CTG CAG CCC GGG GGA
Kpn I *Xho I* *Sal I* *Hind III* *EcoR V* *EcoR I* *Pst I* *Sma I* *BamH I*
BamH I *Spe I* *Xba I* *Not I* *Sac I*
 TCC ACT AGT TCT AGA GCG GCC GCC ACC GCG GTG GAG CTC CAG CTT TTG TTC CCT TTA GTG AGG GTT AAT TGC GCG CTT GGC GTA ATC ATG GTC ATA ---
 ← T3 promoter

pET-3a

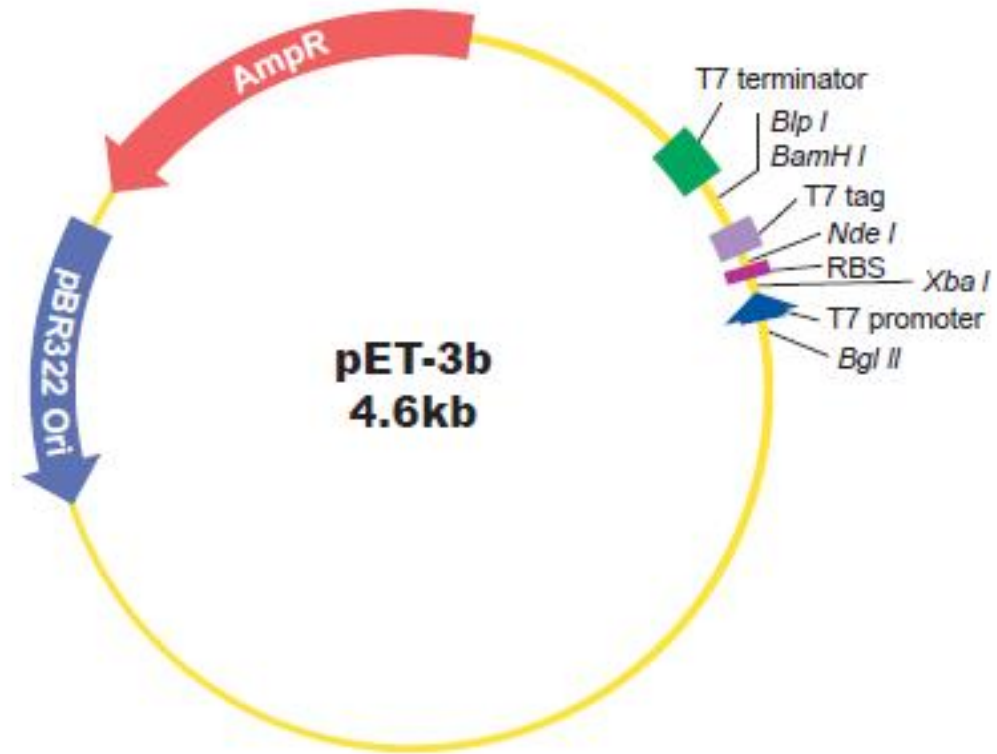


$\xrightarrow{\text{Bgl II}}$ $\xrightarrow{\text{T7 promoter}}$ $\xrightarrow{\text{Xba I}}$ $\xrightarrow{\text{rbs}}$
 --- A GAT CTC GAT CCC GCG AAA TTA ATA CGA CTC ACT ATA GGG AGA CCA CAA CGG TTT CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT

$\xrightarrow{\text{Nde I}}$ $\xrightarrow{\text{T7 tag}}$ $\xrightarrow{\text{BamH I}}$
 ATA CAT ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CGC GGA TCC GGC TGC TAA CAA AGC CCG AAA GGA AGC TGA GTT GGC TGC TGC
 M A S M T G G E E M G R G S G C *Sop*

$\xrightarrow{\text{Bsp I}}$ $\xrightarrow{\text{T7 terminator}}$
 CAC CGC TGA GCA ATA ACT AGC ATA ACC CCT TGG GGC CTC TAA ACG GGT CTT GAG GGG TTT TTT G ---

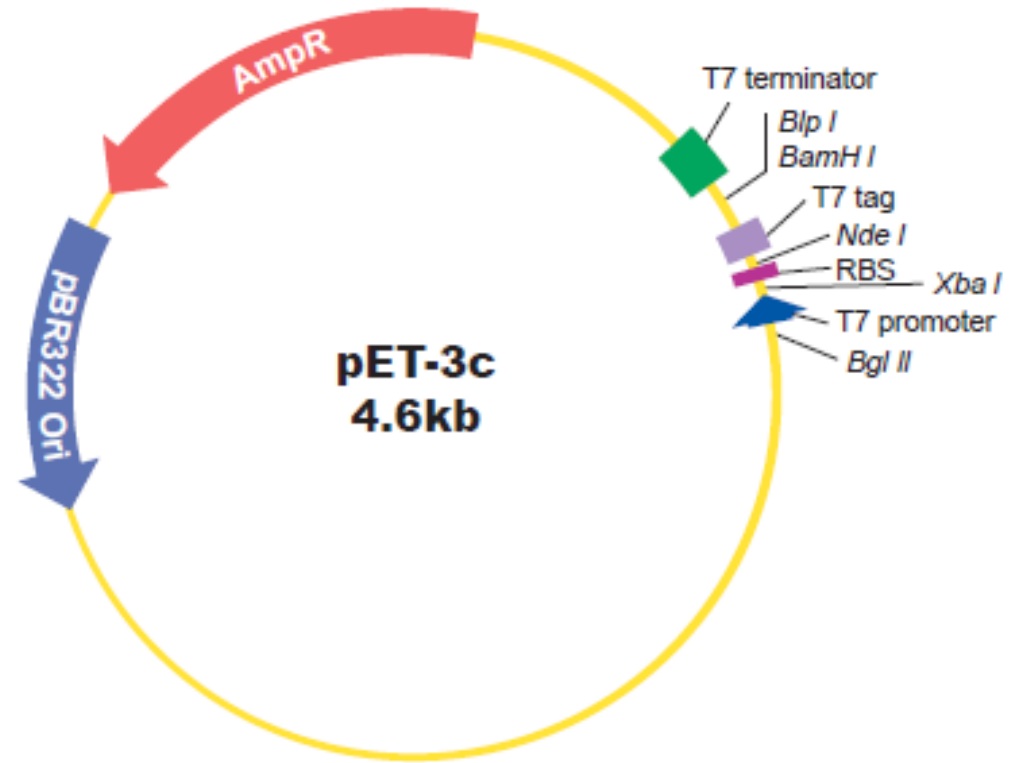
pET-3b



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      Bgl II                T7 promoter                Xba I                rbs
      |                    |                            |                            |
      A GAT CTC GAT CCC GCG AAA TTA ATA CGA CTC ACT ATA GGG AGA CCA CAA CGG TTT CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT
      Nde I                T7 tag                BamH I
      |                    |                    |
      ATA CAT ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CGG GAT CCG GCT GCT AAC AAA GCC CGA AAG GAA GCT GAG TTG GCT GCT GCC
      M  A  S  M  T  G  G  E  E  M  G  R  D  P  A  A  D  K  A  R  K  E  A  E  L  A  A  A
      Bgl I                T7 terminator
      |                    |
      ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CGG GTC TTG AGG GGT TTT TTG ---
      T  A  E  E  Stop
  
```

pET-3c



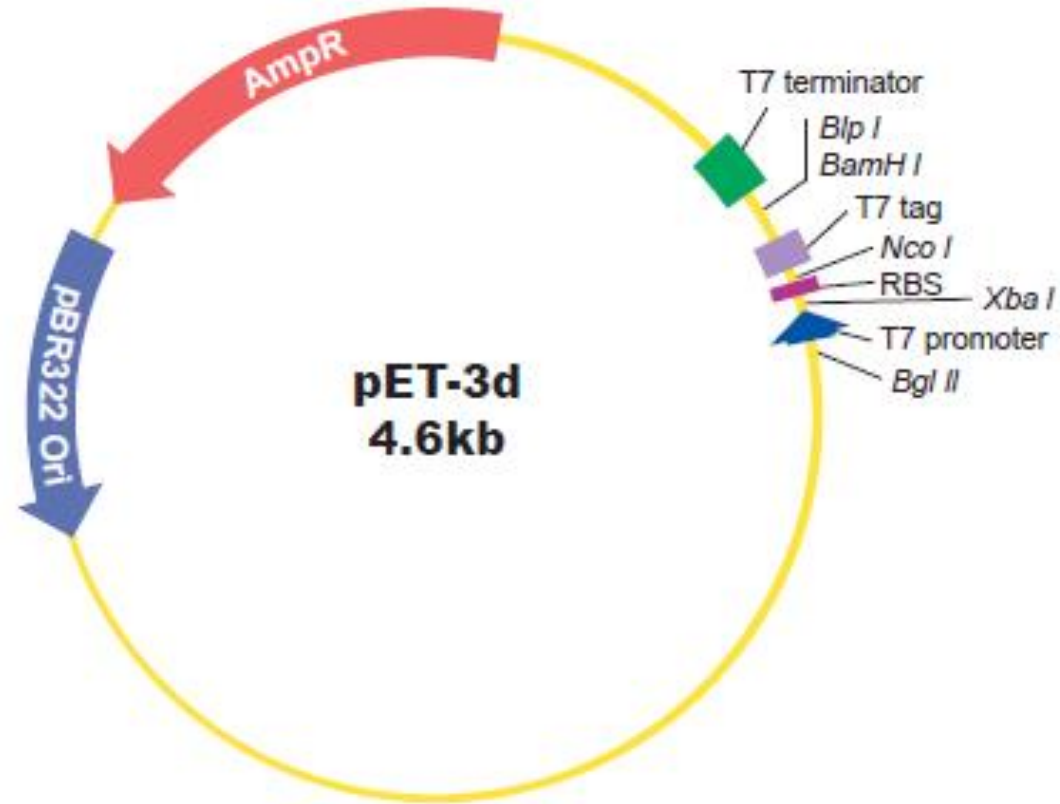
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      Bgl II           T7 promoter           Xba I           rbs
-- A GAT CTC GAT CCC GCG AAA TTA ATA CGA CTC ACT ATA GGG AGA CCA CAA CGG TTT CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT

      Nde I           T7 tag           BamH I
ATA CAT ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CGG ATC CGG CTG CTA ACA AAG CCC GAA AGG AAG CTG AGT TGG CTG CTG CCA
      M  A  S  M  T  G  G  E  E  M  G  R  I  R  L  L  T  K  P  E  R  K  L  S  W  L  L  P

      Bsp I           T7 terminator
CCG CTG AGC AAT AAC TAG CAT AAC CCC TTG GGG CCT CTA AAC GGG TCT TGA GGG GTT TTT TG ---
      P  L  S  N  N  Stop
  
```

pET-3d

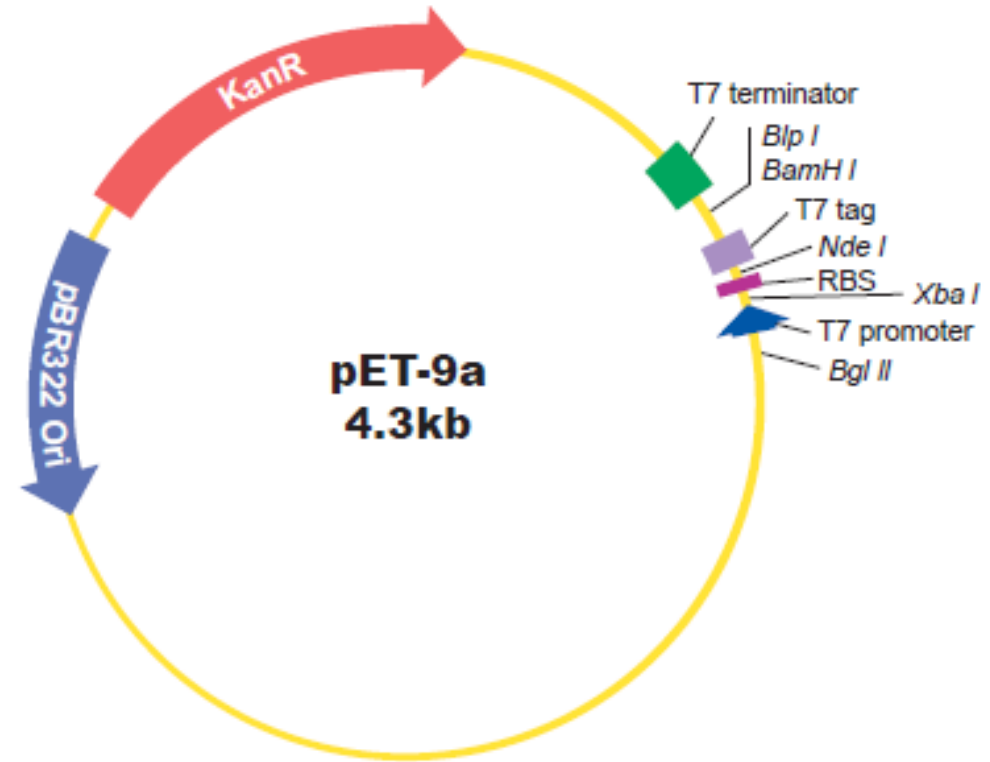


Bgl II T7 promoter Xba I rbs
 --- AGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GAG ACC ACA ACG GTT TCC CTC TAG AAA TAA TTT TGT TTA ACT TTA AGA AGG AGA ---

Nco I T7 tag BamH I
 TAT ACC ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CGG ATC CGG CTG CTA ACA AAG CCC GAA AGG AAG CTG AGT TGG CTG CTG CCA
 M A S M T G G E E M G R I R L L T K P E R K L S W L L P

Bsp I T7 terminator
 CCG CTG AGC AAT AAC TAG CA TAA CCC CTT GGG GCC TCT AAA CGG GTC TTG AGG GGT TTT TTG ---
 P L S N N Stop

pET-9a



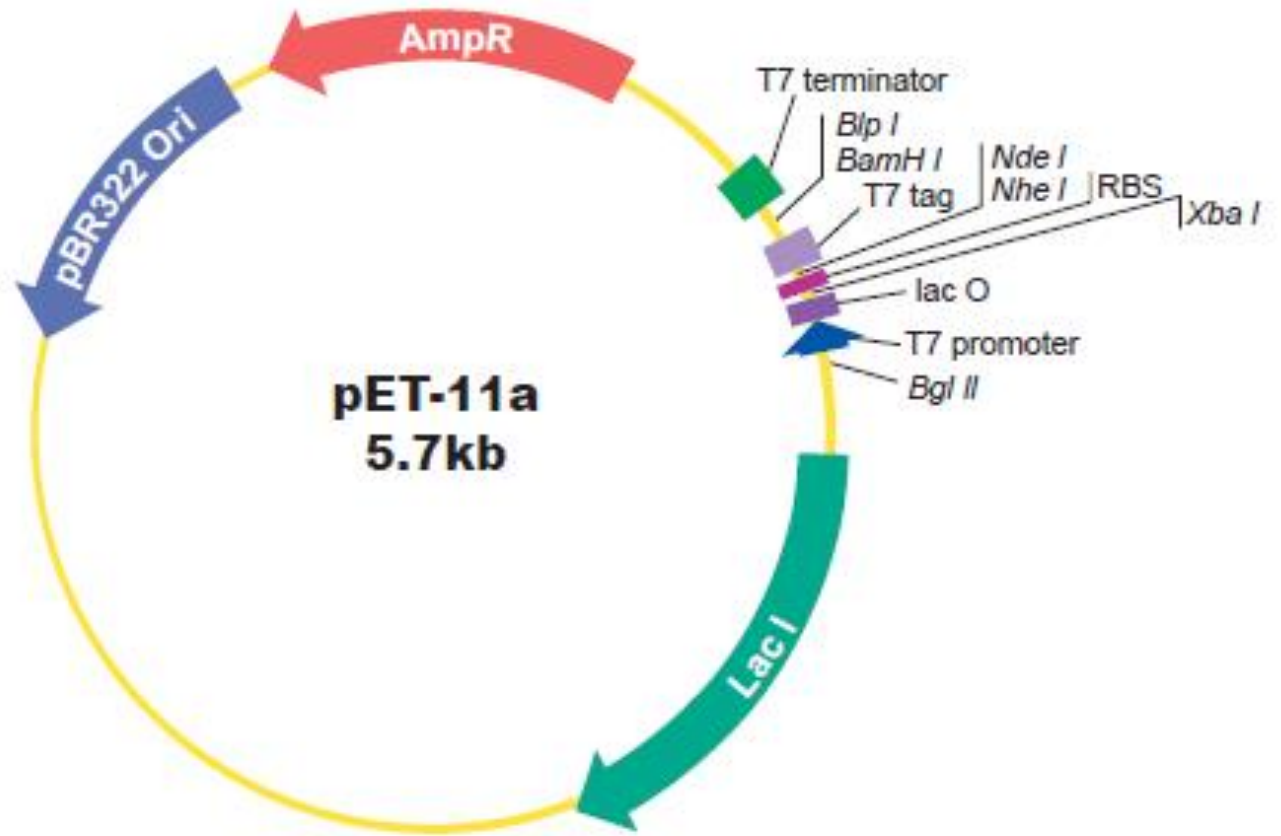
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--- A GAT CTC GAT CCC GCG AAA TTA ATA CGA CTC ACT ATA GGG AGA CCA CAA CGG TTT CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT

      Nde I           T7 tag           BamH I
ATA CAT ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CGC GGA TCC GGC TGC TAA CAA AGC CCG AAA GGA AGC TGA GTT GGC TGC TGC
      M  A  S  M  T  G  G  E  E  M  G  R  G  S  G  C  Stop

      Bsp I           T7 terminator
CAC CGC TGA GCA ATA ACT AGC ATA ACC CCT TGG GGC CTC TAA ACG GGT CTT GAG GGG TTT TTT G ---
  
```

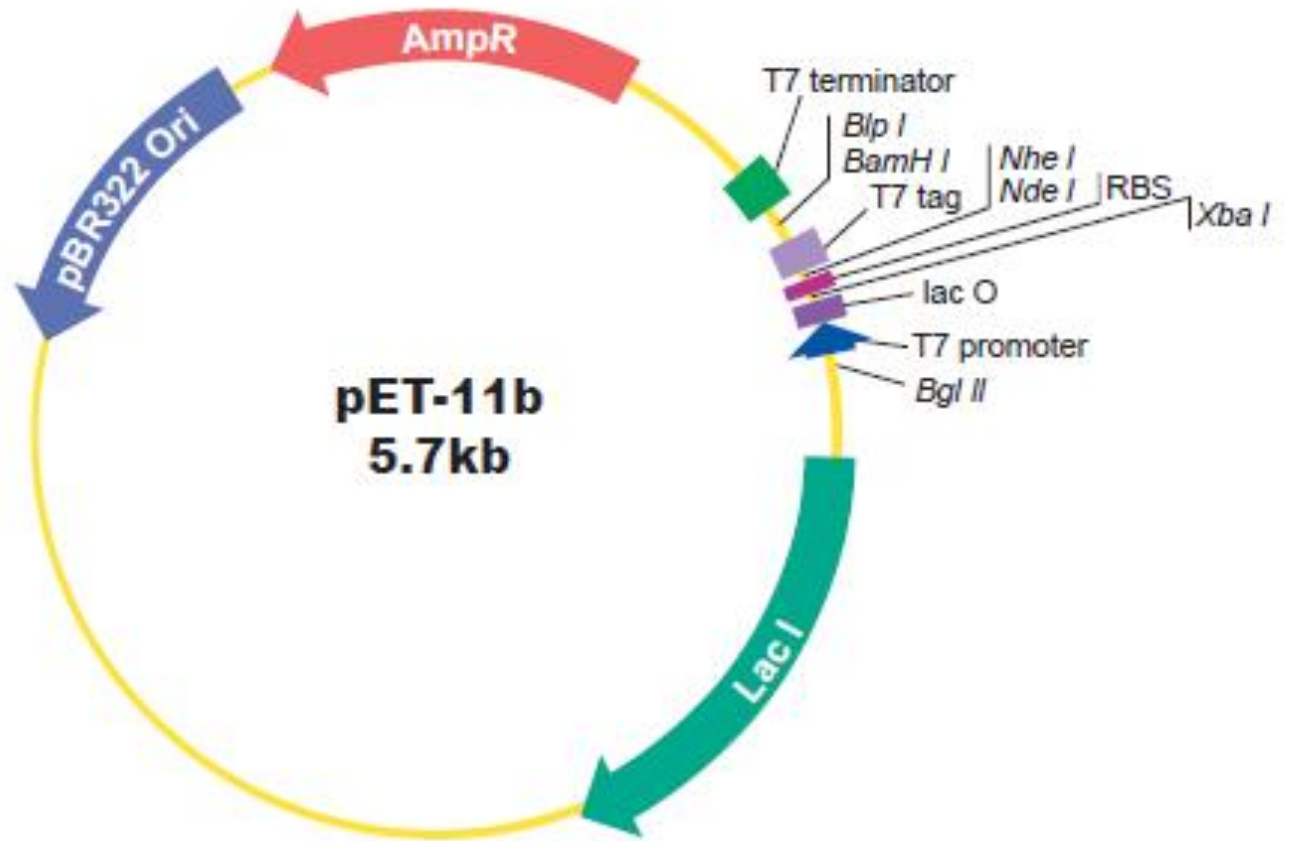
pET-11a



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      Bgl II           T7 promoter           lac operator           Xba I           rbs
--- AGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT
      Nde I   Nhe I   T7 tag           BamH I
ATA CAT ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CGC GGA TCC GGC TGC TAA CAA AGC CCG AAA GGA AGC TGA GTT GGC TGC TGC CAC CGC TGA GCA
      M  A  S  M  T  G  G  Q  Q  M  G  R  G  S  G  C  Stop
      T7 terminator
ATA ACT AGC ATA ACC CCT TGG GGC CTC TAA ACG GGT CTT GAG GGG TTT TTT G ---
  
```

pET-11b

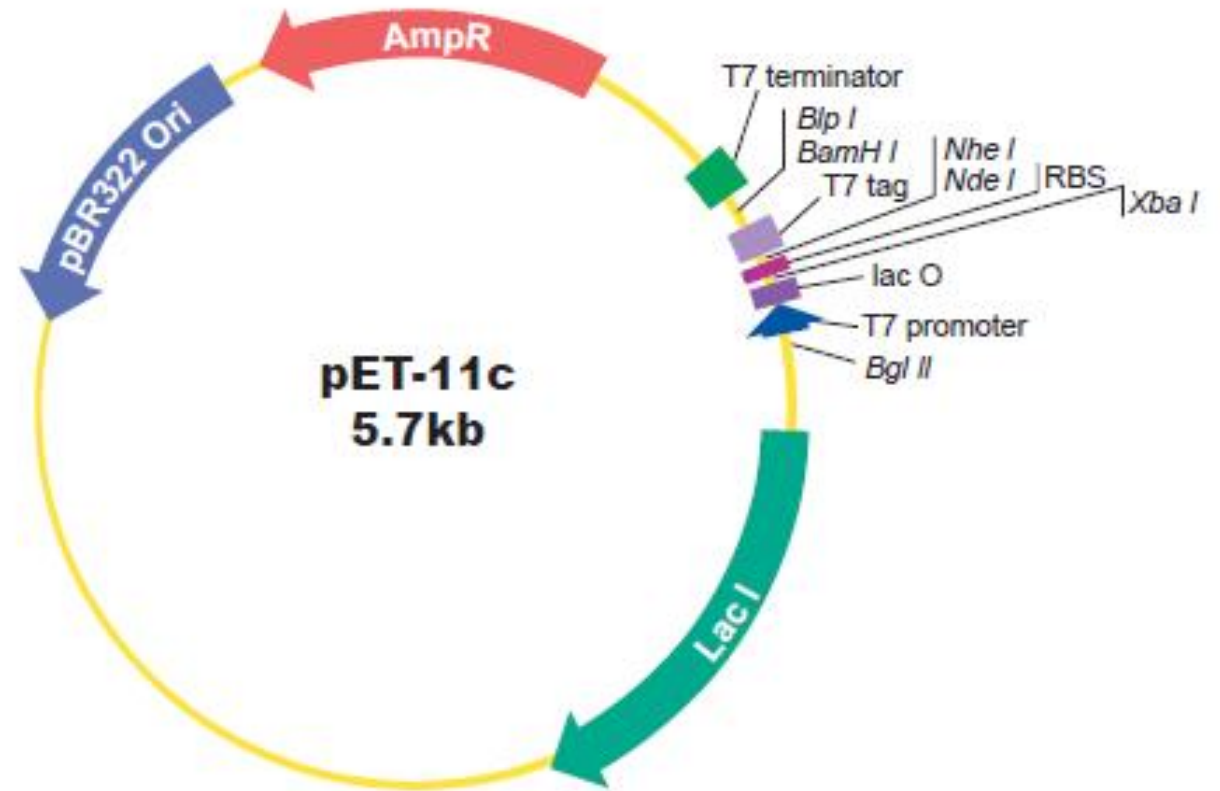


Bgl II T7 promoter lac operator *Xba I* rbs
 --- AGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT

Nde I *Nhe I* T7 tag *BamH I* *Bsp I*
 ATA CAT ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CGG GAT CCG GCT GCT AAC AAA GCC CGA AAG GAA GCT GAG TTG GCT GCT GCC ACC GCT GAG CAA
 M A S M T G G Q Q M G R D P A A N K A R K E A E L A A A T A E Q

T7 terminator
 TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CGG GTC TTG AGG GGT TTT TTG ---
 Stop

pET-11c

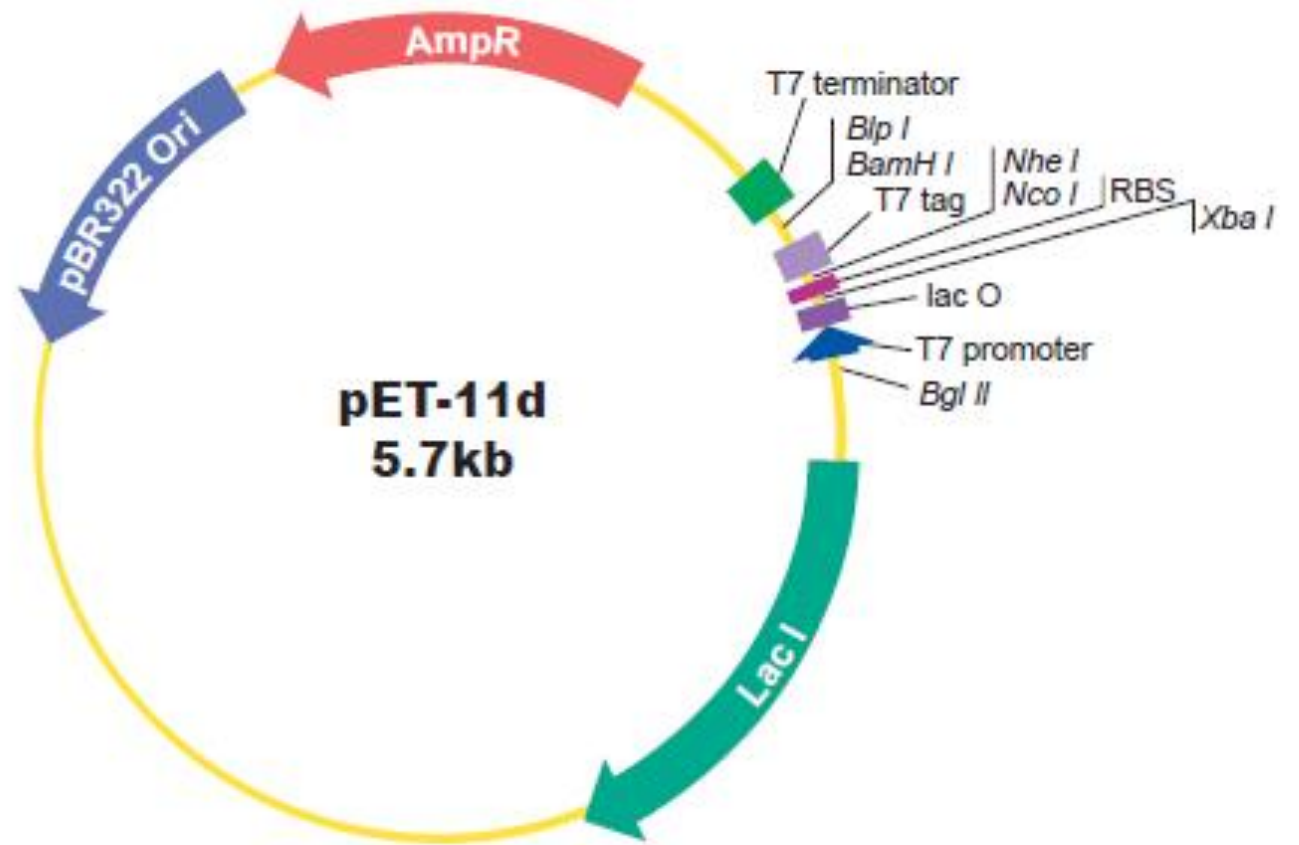


Bgl II T7 promoter lac operator *Xba I* rbs
 --- AGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT ---

Nde I *Nhe I* T7 tag *BamH I* *Bgl I*
 ATA CAT ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CGG ATC CGG CTG CTA ACA AAG CCC GAA AGG AAG CTG AGT TGG CTG CTG CCA CCG CTG AGC AAT
 M A S M T G G Q Q M G R I R L L T K P E R K L S W L L P P L S N

T7 terminator
 AAC TAG CAT AAC CCC TTG GGG CCT CTA AAC GGG TCT TGA GGG GTT TTT TG ---
 N Stop

pET-11d

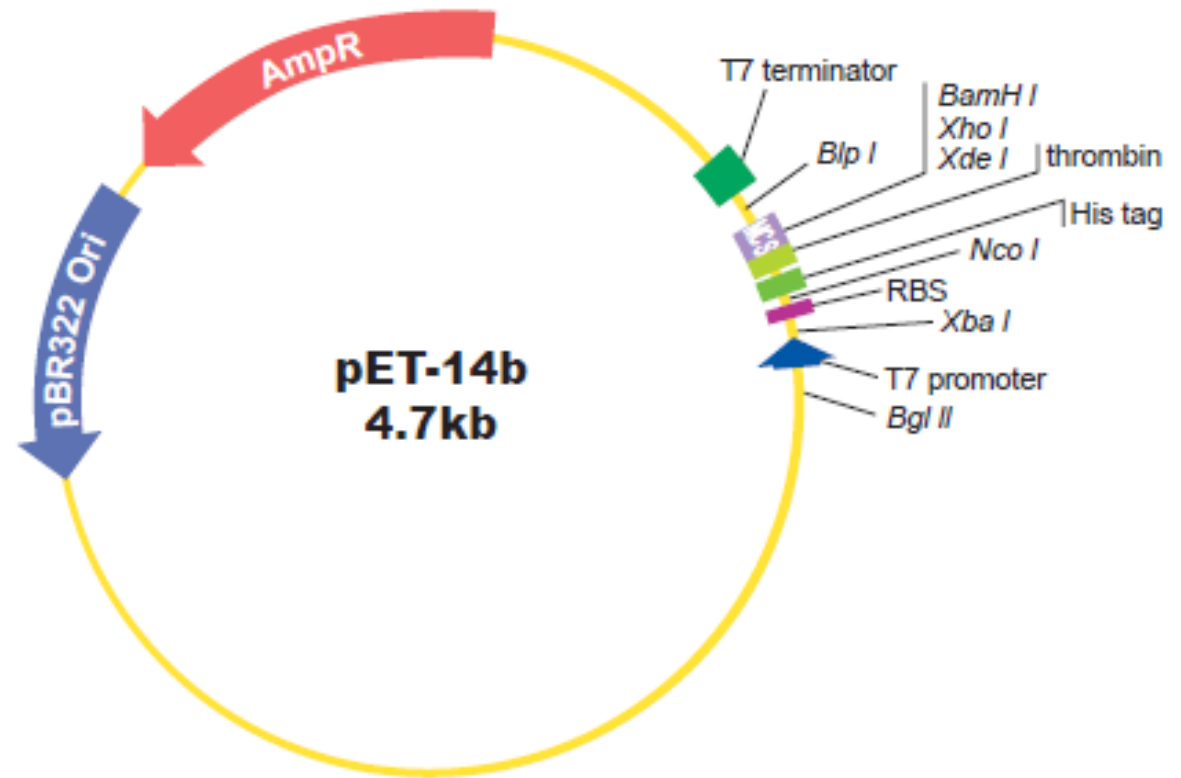


Bgl II T7 promoter lac operator *Xba I* rbs
 --- AG ATC TCG ATC CCG CGA AAT TAA TAC GAC TCA CTA TAG GGG AAT TGT GAG CCG ATA ACA ATT CCC CTC TAG AAA TAA TTT TGT TTA ACT TTA AGA AGG AGA ---

Nco I *Nhe I* T7 tag *BamH I* *Bgl I*
 TAT ACC ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CGG ATC CGG CTG CTA ACA AAG CCC GAA AGG AAG CTG AGT TGG CTG CTG CCA CCG CTG AGC
 M A S M T G G E E M G R I R L L T K P E R K L S W L L P P L S

T7 terminator
 AAT AAC TAG CAT AAC CCC TTG GGG CCT CTA AAC GGG TCT TGA GGG GTT TTT TG ---
 N N Stop

pET-14b



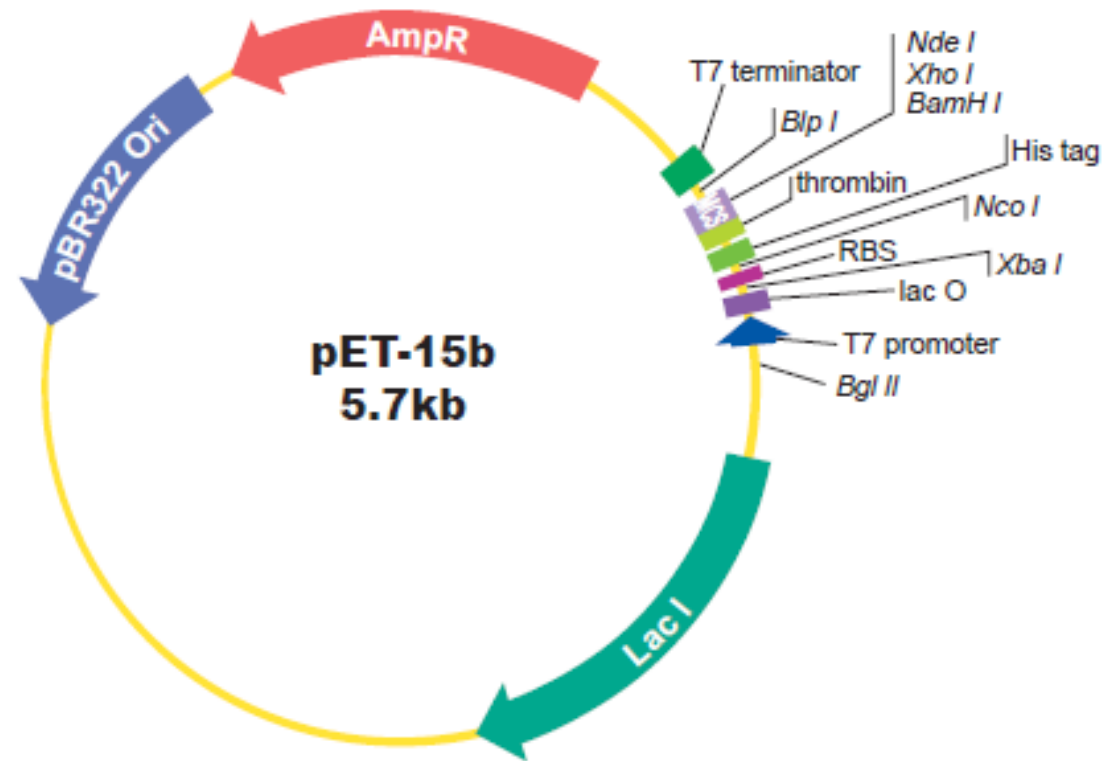
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      Bgl II                                T7 promoter                                Xba I                                rbs
--- AGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GAG ACC ACA ACG GTT TCC CTC TAG AAA TAA TTT TGT TTA ACT TTA AGA AGG AGA

      Nco I                                His tag                                Nde I  Xho I  BamH I
TAT ACC ATG GGC AGC AGC CAT CAT CAT CAT CAC AGC AGC GGC CTG GTG CCG CGC GGC AGC CAT ATG CTC GAG GAT CCG GCT GCT AAC AAA GCC CGA
      M  G  S  S  H  H  H  H  H  H  S  S  G  L  V  P  R  G  S  H  M  L  E  D  P  A  A  N  K  A  R
                                thrombin site

      Blp I                                T7 terminator
AAG GAA GCT GAG TTG GCT GCT GCC ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CGG GTC TTG AGG GGT TTT TTG ---
      K  E  A  E  L  A  A  A  T  A  E  Q  Stop
  
```

pET-15b



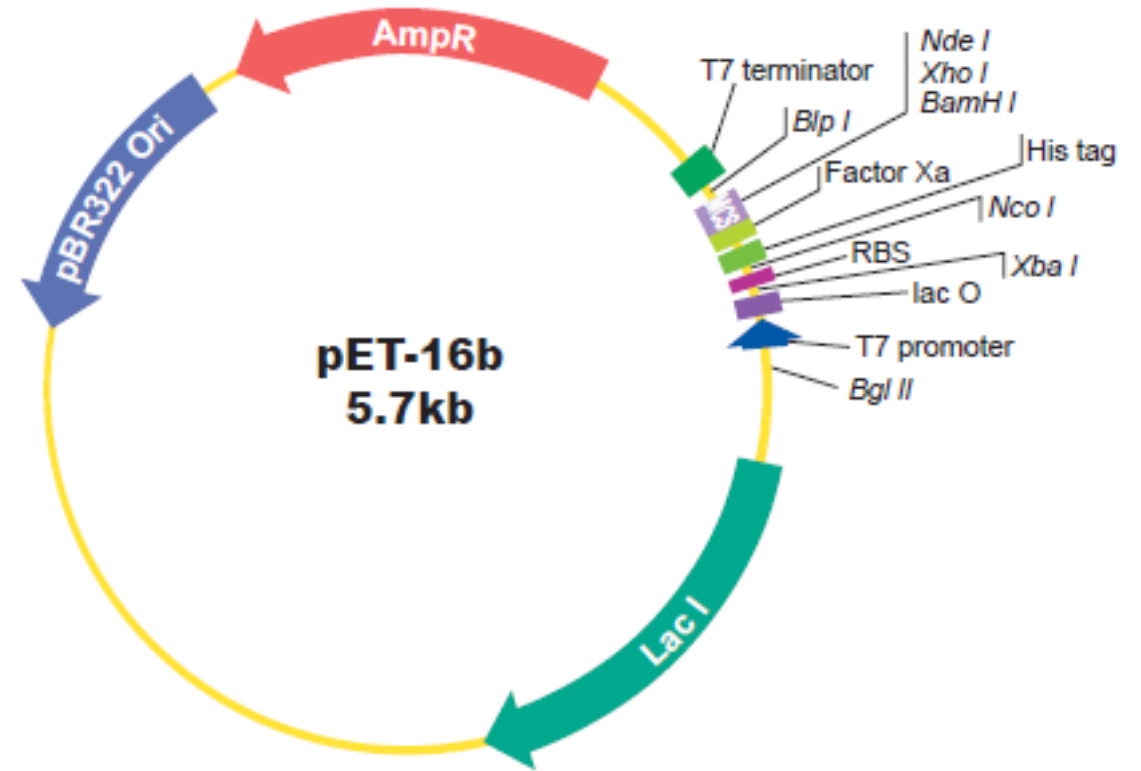
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      Bgl II                T7 promoter                lac operator                Xba I                rbs
--- AG ATC TCG ATC CCG CGA AAT TAA TAC GAC TCA CTA TAG GGG AAT TGT GAG CGG ATA ACA ATT CCC CTC TAG AAA TAA TTT TGT TTA ACT TTA AGA AGG AGA

      Nco I                His tag                Nde I  Xho I  BamH I
TAT ACC ATG GGC AGC AGC CAT CAT CAT CAT CAT CAC AGC AGC GGC CTG GTG CCG CGC GGC AGC CAT ATG CTC GAG GAT CCG GCT GCT AAC AAA GCC CGA
      M  G  S  S  H  H  H  H  H  H  S  S  G  L  V  P  R  G  S  H  M  L  E  D  P  A  A  N  K  A  R
                        thrombin site

AAG GAA GCT GAG TTG GCT GCT GCC ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CGG GTC TTG AGG GGT TTT TTG ---
      Bgl I                T7 terminator
      K  E  A  E  L  A  A  A  T  A  E  Q  Stop
  
```

pET-16b

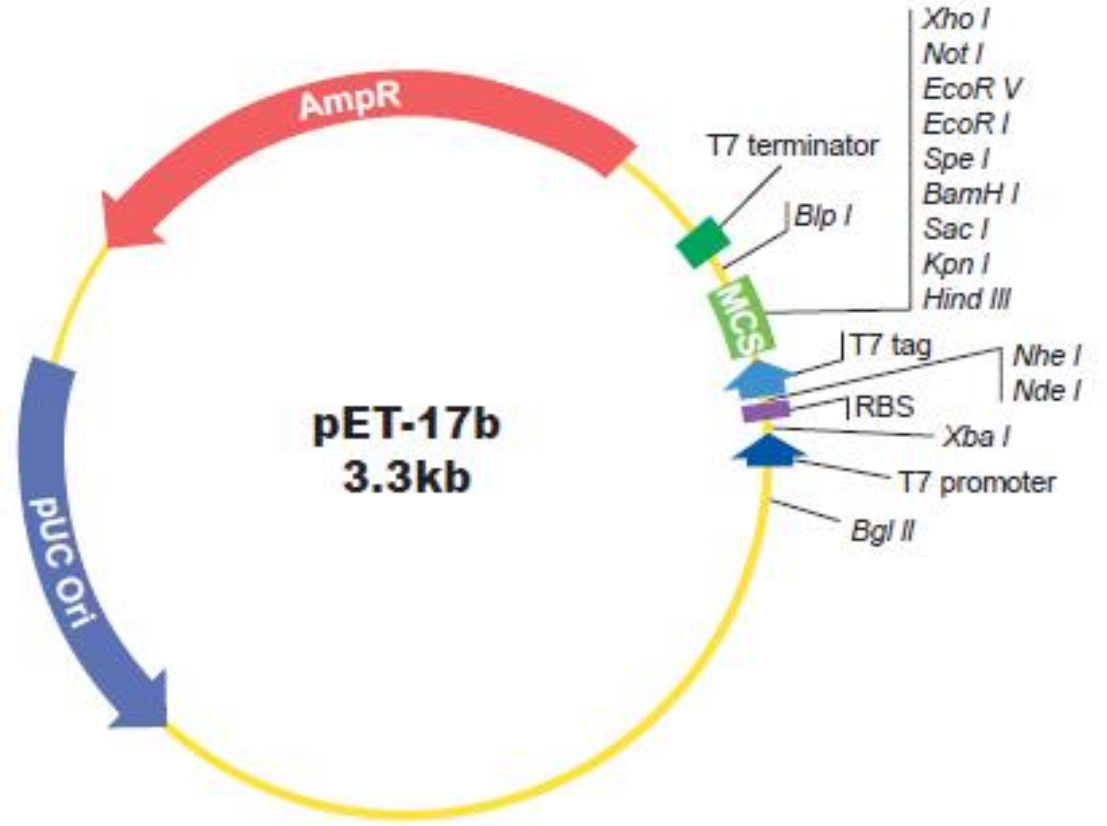


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      Bgl I          T7 promoter          lac operator          Xba I          rbs
--- AG ATC TCG ATC CCG CGA AAT TAA TAC GAC TCA CTA TAG GGG AAT TGT GAG CGG ATA ACA ATT CCC CTC TAG AAA TAA TTT TGT TTA ACT TTA AGA AGG AGA

      Nco I          His tag          Nde I  Xho I  BamH I
TAT ACC ATG GGC CAT CAT CAT CAT CAT CAT CAT CAT CAC AGC AGC GGC CAT ATC GAA GGT CGT CAT ATG CTC GAG GAT CCG GCT GCT AAC AAA GCC CGA
      M  G  H  H  H  H  H  H  H  H  H  H  S  S  G  H  I  E  G  R  H  M  L  E  D  P  A  A  N  K  A  R
                                Factor Xa
AAG GAA GCT GAG TTG GCT GCT GCC ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CGG GTC TTG AGG GGT TTT TTG ---
      K  E  A  E  L  A  A  A  T  A  E  Q  stop
  
```

pET-17b



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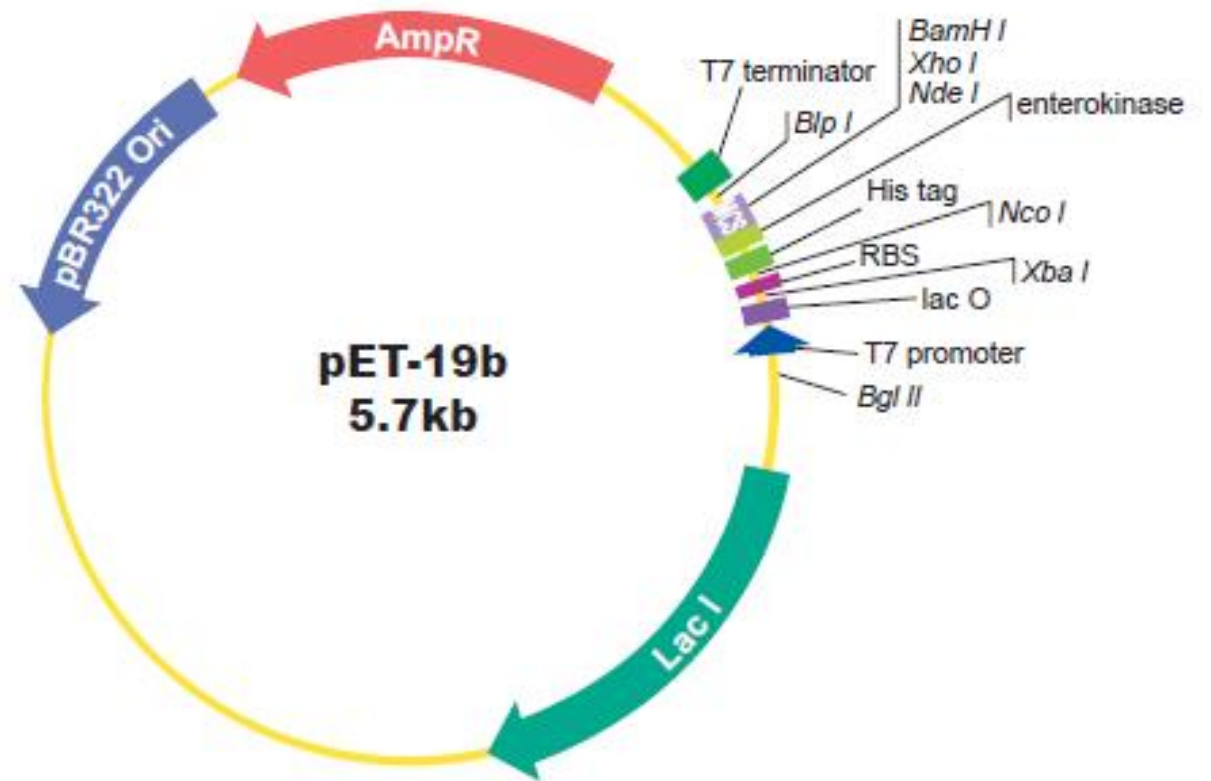
      Bgl II           T7 promoter           Xho I           rbs
--- A GAT CTC GAT CCC GCG AAA TTA ATA CGA CTC ACT ATA GGG AGA CCA CAA CGG TTT CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT

      Nde I   Nhe I           T7 tag           Hind III   Kpn I   Sac I   BamH I   Spe I           EcoR I
ATA CAT ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CGG GAT TCA AGC TTG GTA CCG AGC TCG GAT CCA CTA GTA ACG GCC GCC AGT GTG CTG GAA TTC
      M   A   S   M   T   G   G   Q   Q   M   G   R   D   S   S   L   V   P   S   S   D   P   L   V   T   A   A   S   V   L   E   F

      EcoR V           Not I   Xho I           Rps I
TGC AGA TAT CCA TCA CAC TGG CCG CCG CTC GAG CAG ATC CGG CTG CTA ACA AAG CCC GAA AGG AAG CTG AGT TGG CTG CTG CCA CCG CTG AGC AAT
      C   R   Y   P   S   H   W   R   P   L   E   Q   I   R   L   L   T   K   P   E   R   K   L   S   W   L   L   P   L   S   N

      T7 terminator
AAC TAG CAT AAC CCC TTG GGG CCT CTA AAC GGG TCT TGA GGG GTT TTT TG ---
      N   stop
  
```

pET-19b



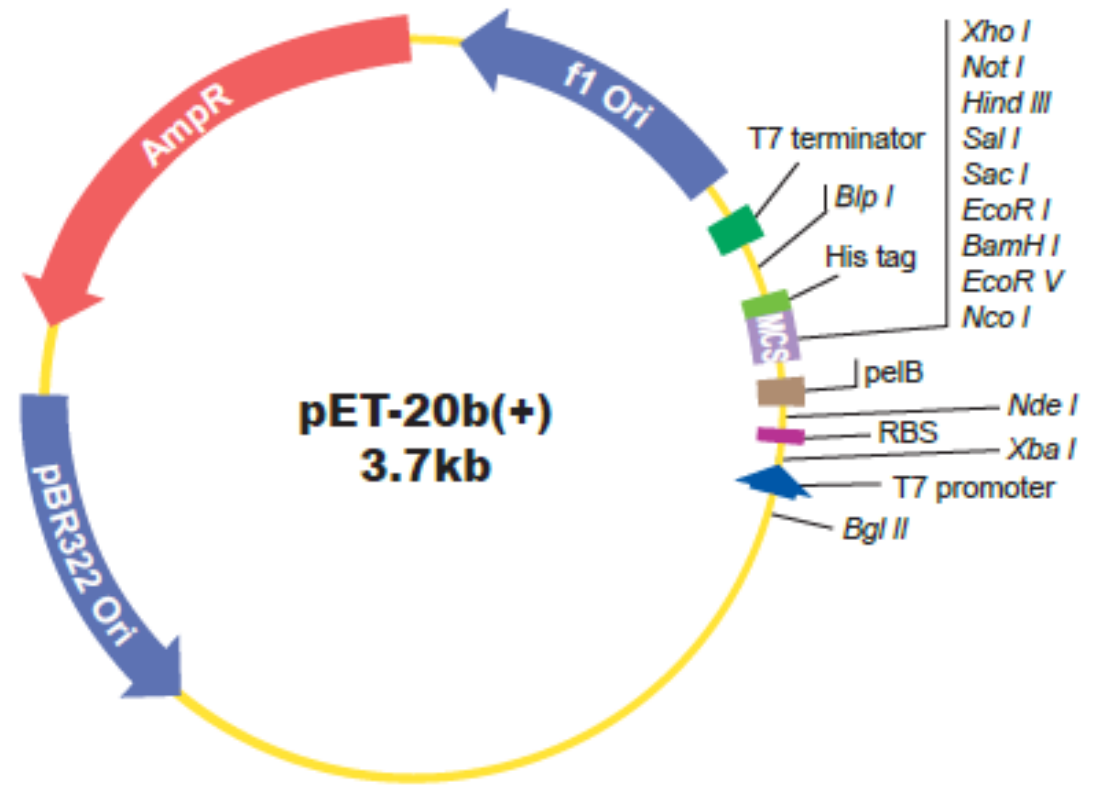
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      Bgl II          T7 promoter          lac operator          Xba I          rbs
--- AG ATC TCG ATC CCG CGA AAT TAA TAC GAC TCA CTA TAG GGG AAT TGT GAG CGG ATA ACA ATT CCC CTC TAG AAA TAA TTT TGT TTA ACT TTA AGA AGG AGA

      Nco I          His tag          Nde I    Xho I    BamH I
TAT ACC ATG GGC CAT CAT CAT CAT CAT CAT CAT CAT CAC AGC AGC GGC CAT ATC GAC GAC GAC GAC AAG CAT ATG CTC GAG GAT CCG GCT GCT AAC AAA
      M  G  H  H  H  H  H  H  H  H  H  S  S  G  H  I  D  D  D  D  K  H  M  L  E  D  P  A  A  N  K
                                     enterokinase site

      Bsp I          T7 terminator
GCC CGA AAG GAA GCT GAG TTG GCT GCT GCC ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CGG GTC TTG AGG GGT TTT TTG --
      A  R  K  E  A  E  L  A  A  A  T  A  E  Q  Stop
  
```

pET-20b(+)



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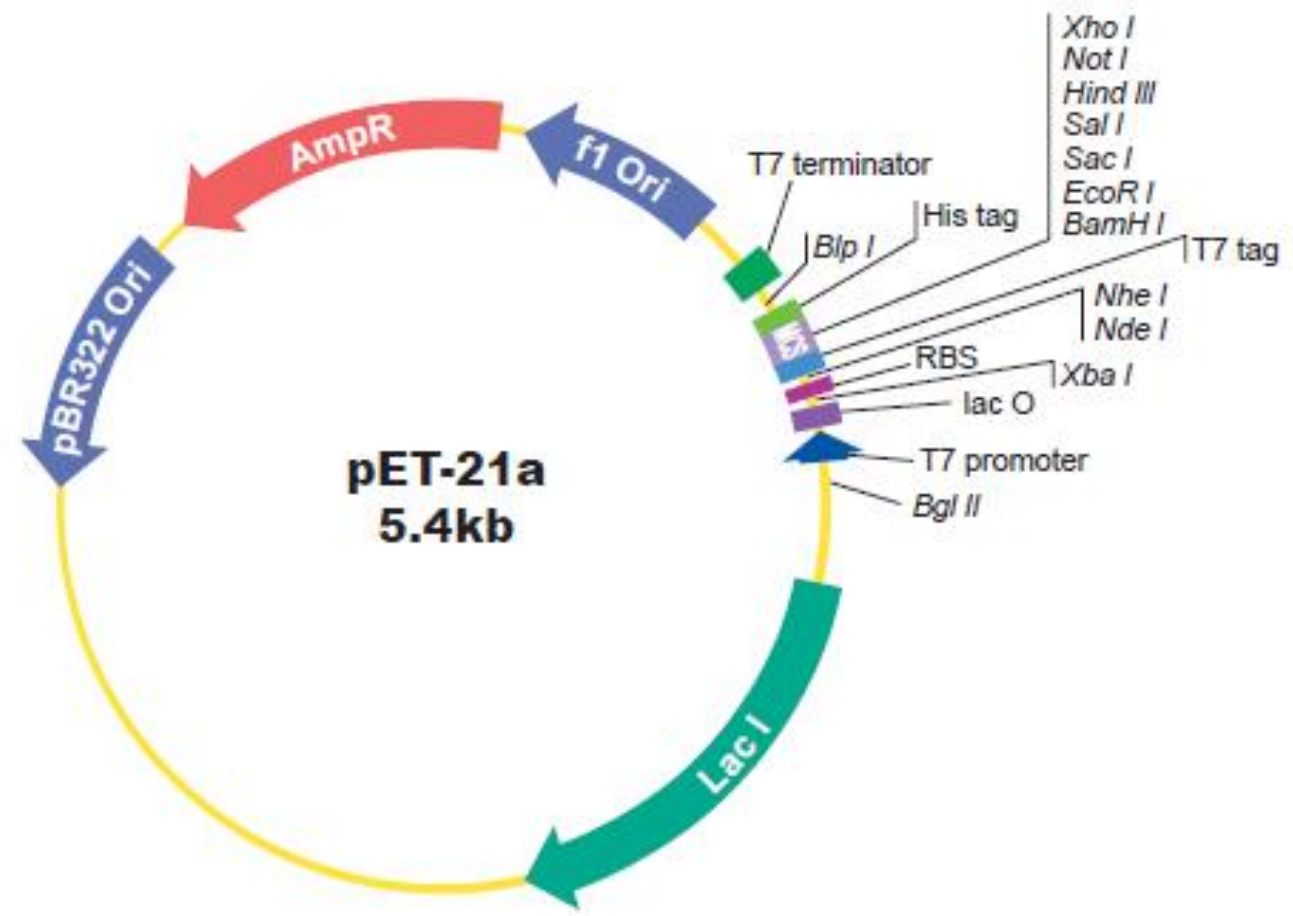
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--- A GAT CTC GAT CCC GCG AAA TTA ATA CGA CTC ACT ATA GGG AGA CCA CAA CCG TTT CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT

      Nde I          pelB leader          Nco I  EcoR V
ATA CAT ATG AAA TAC CTG CTG CCG ACC GCT GCT GCT GGT CTG CTG CTC CTC GCT GCC CAG CCG GCG ATG GCC ATG GAT ATC GGA ATT AAT
      M  K  Y  L  L  P  T  A  A  A  G  L  L  L  L  A  A  Q  P  A  M  A  M  D  I  G  I  N

      BamH I  EcoR I  Sac I  Sal I  Hind III  Not I  Xho I  His tag
TCG GAT CCG AAT TCG AGC TCC GTC GAC AAG CTT GCG GCC GCA CTC GAG CAC CAC CAC CAC CAC TGA GAT CCG GCT GCT AAC AAA GCC
      S  D  P  N  S  S  S  V  D  K  L  A  A  A  L  E  H  H  H  H  H  H  Stop

      Bsp I          T7 terminator
CGA AAG GAA GCT GAG TTG GCT GCT GCC ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CCG GTC TTG AGG GGT TTT TTG ---
    
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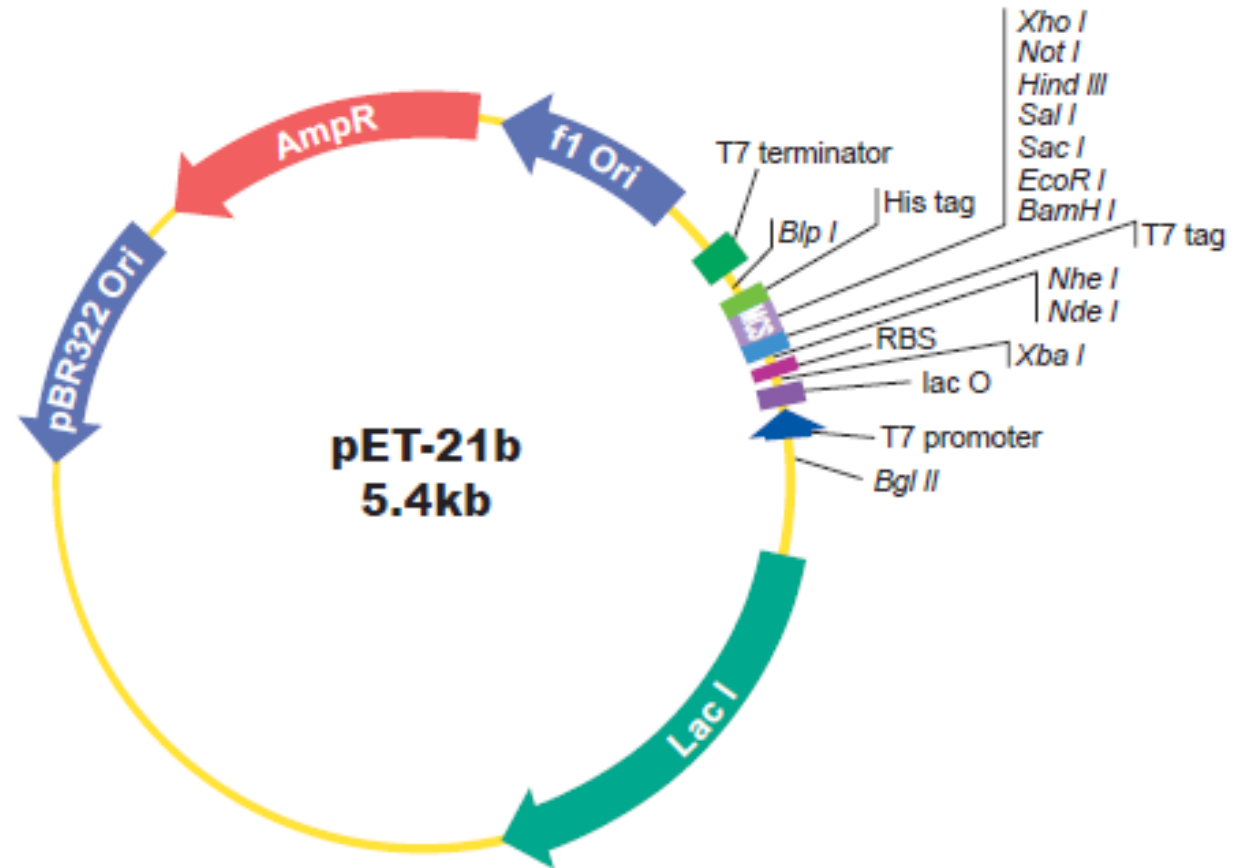
pET-21a



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      Bgl II                T7 promoter                lac operator                Xba I                rbs
--- AGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GIG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT
      Nde I      Nde I                T7 tag                BamH I      EcoR I      Sac I      Sal I      Hind III      Not I      Xba I                His tag
ATA CAT ATG OCT AGC ATG ACT GGT GGA CAG CA A ATG GGT CCG GGA TCC GAA TTC GAG CTC CGT CGA CAA GCT TGC GGC CCG ACT CGA GCA GCA CCA CCA CCA CCA CTA AGA
      M   A   S   M   T   G   G   Q   Q   M   G   R   G   S   E   F   E   L   R   R   Q   A   C   G   R   T   R   A   P   P   P   P   L   R
TCC GGC TGC TAA CAA AGC CCG AAA GGA AGC TGA GTT GGC TGC TGC CAC CCG TGA GCA ATA ACT AGC ATA ACC CCT TGG GGC CTC TAA ACG GGT CTT GAG GGG TTT TTT G ---
      S   G   C   Stop                Bgl I                T7 terminator
  
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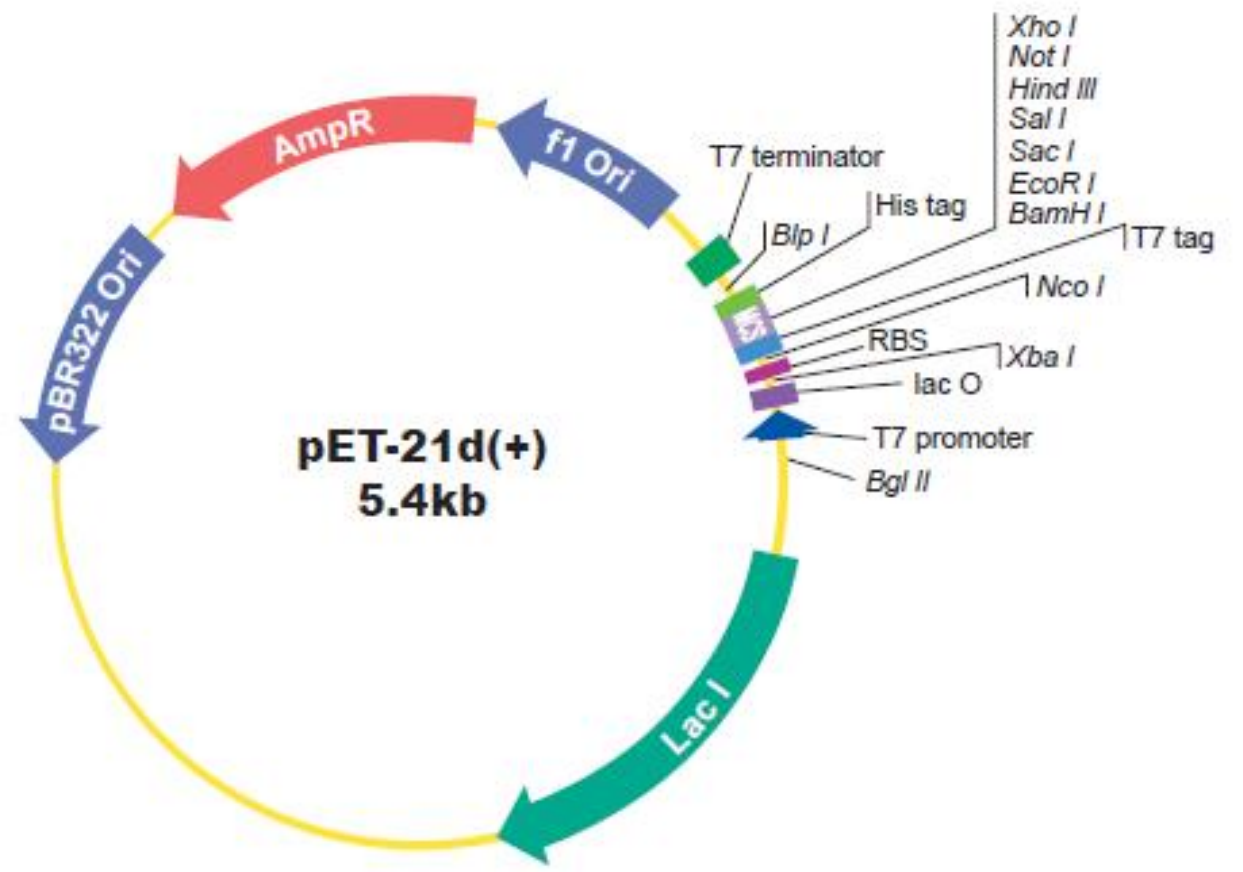
pET-21b



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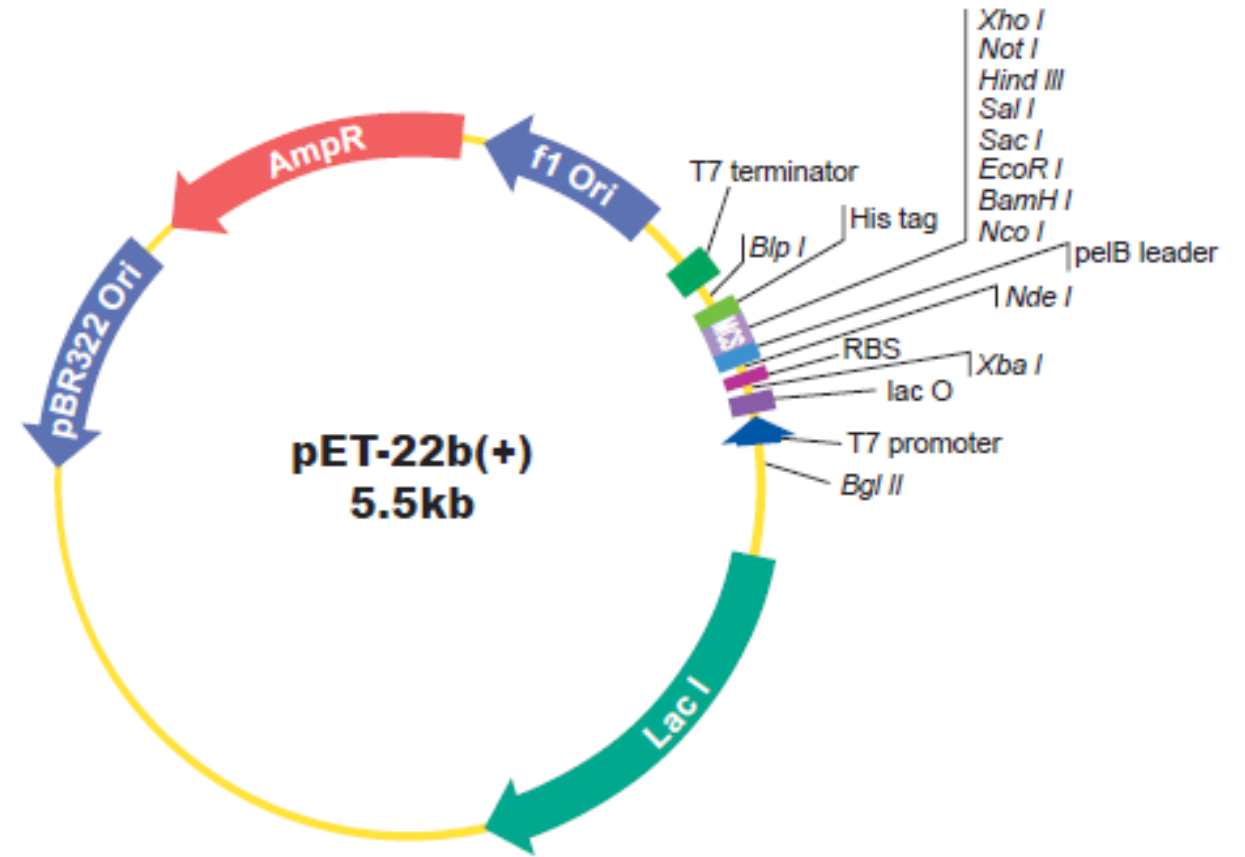
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--- AGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT
      Nde I   Nde I   T7 tag          BamH I   EcoR I   Sac I   Sal I   Hind III   Not I   Xho I   His tag
ATA CAT ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CGG GAT CCG AAT TCG AGC TCC GTC GAC AAG CTT GCG GCC GCA CTC GAG CAC CAC CAC CAC CAC TGA
      M   A   S   M   T   G   G   Q   Q   M   G   R   D   P   N   S   S   S   V   D   K   L   A   A   A   L   E   H   H   H   H   H   H   S   t   a   p
      Bgl I          T7 terminator
GAT CCG GCT GCT AAC AAA GCC CGA AAG GAA GCT GAG TTG GCT GCT GCC ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CGG GTC TTG AGG GGT TTT TTG ---
  
```


pET-21d(+)



Bgl II T7 promoter lac operator *Xba I* rbs
 --- AG ATC TCG ATC CCG CGA AAT TAA TAC GAC TCA CTA TAG GGG AAT TGT GAG CCG ATA ACA ATT CCC CTC TAG AAA TAA TTT TGT TTA ACT TTA AGA AGG AGA TAT ---
Nco I T7 tag *BamH I* *EcoR I* *Sac I* *Sal I* *Hind III* *Not I* *Xba I* His tag
 ACC ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CCG ATC CGA ATT CGA GCT CCG TCG ACA AGC TTG CCG CCG CAC TCG AGC ACC ACC ACC ACC ACT GAG
 M A S M T G G Q Q M G R I R I R A P S T S L R P H S S T T T T T E
Bgl I T7 terminator
 ATC CCG CTG CTA ACA AAG CCC GAA MGG AAG CTG AGT TGG CTG CTG CCA CCG CTG AGC AAT AAC TAG CAT AAC CCC TTG GGG CCT CTA AAC GGG TCT TGA GGG GTT TTT TG ---
 I R L L T K P E R K L S W L L P P L S N N Stop

pET-22b(+)



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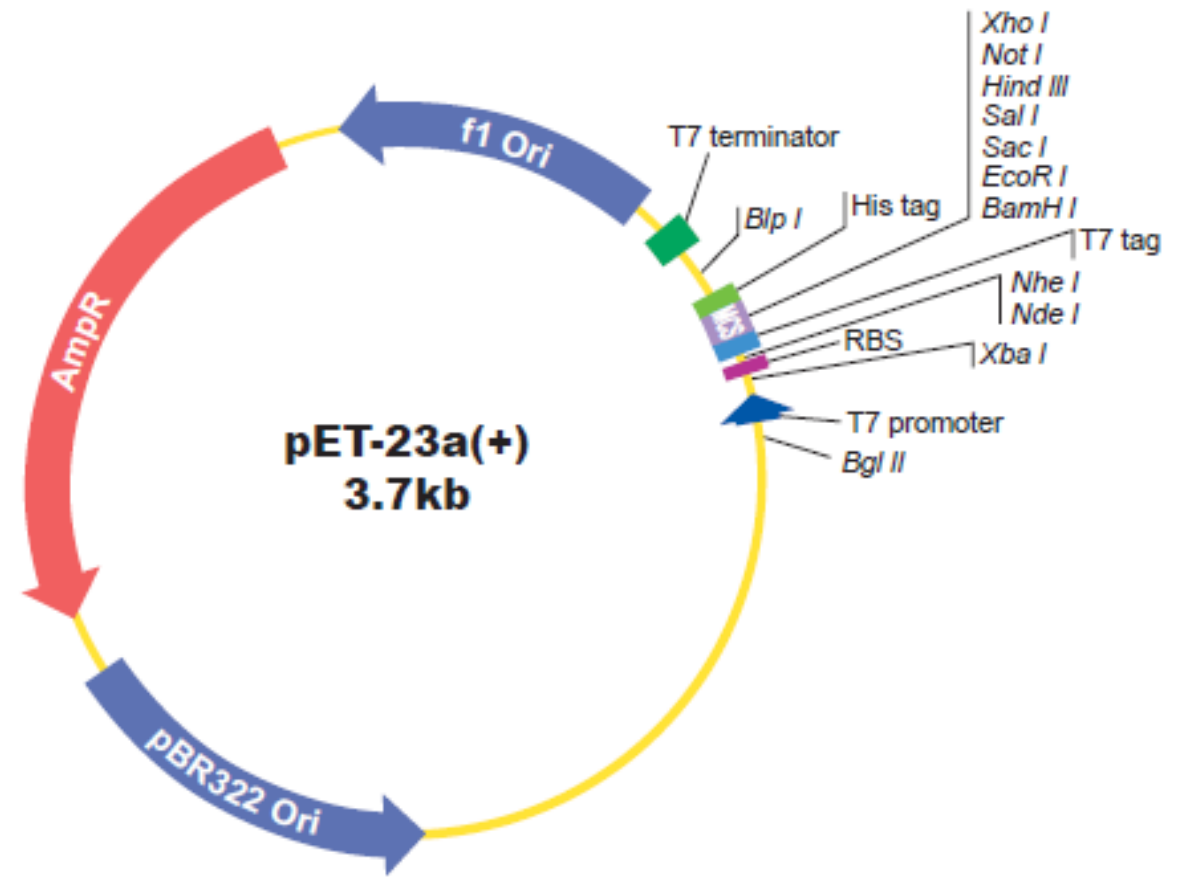
      Bgl II           T7 promoter           lac operator           Xba I           rbs
--- AGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT

      Nde I           pelB leader           Nco I           BamH I   EcoR I   Sac I
ATA CAT ATG AAA TAC CTG CTG CCG ACC GCT GCT GCT GGT CTG CTG CTC CTC OCT GCC CAG CCG GCG ATG GCC ATG GAT ATC GGA ATT AAT TCG GAT CCG AAT TCG AGC TCC
      M  K  Y  L  L  P  T  A  A  A  G  L  L  L  L  A  A  Q  P  A  M  A  M  D  I  G  I  N  S  D  P  N  S  S  S

      Sal I   Hind III   Not I   Xba I   His tag           Bsp I
GTC GAC AAG CTT GCG GCC GCA CTC GAG CAC CAC CAC CAC CAC TGA GAT CCG GCT OCT AAC AAA GCC CGA AAG GAA GCT GAG TTG GCT GCT GCC ACC GCT GAG CAA
      V  D  K  L  A  A  A  L  E  H  H  H  H  H  H  Stp

      T7 terminator
TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CGG GTC TTG AGG GGT TTT TTG ---
  
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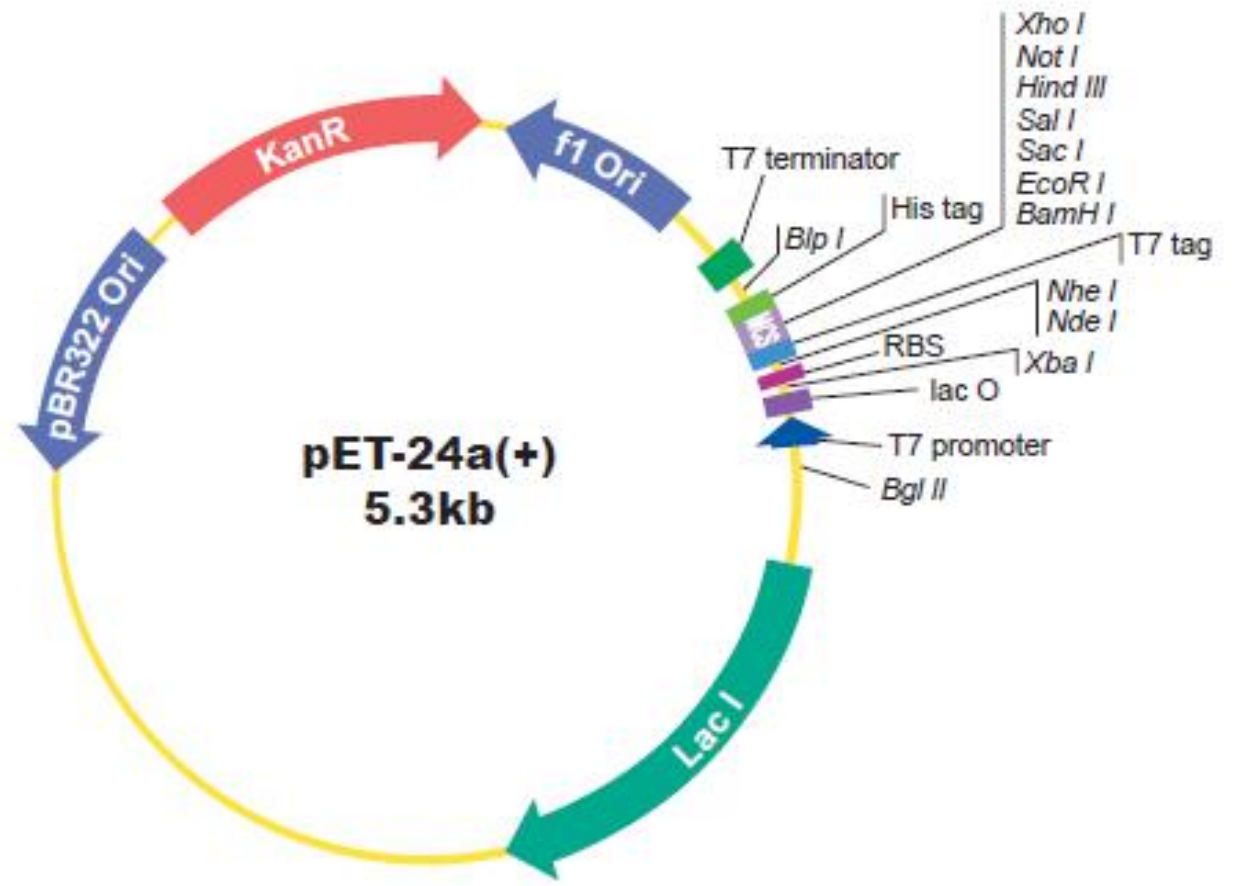
pET-23a(+)



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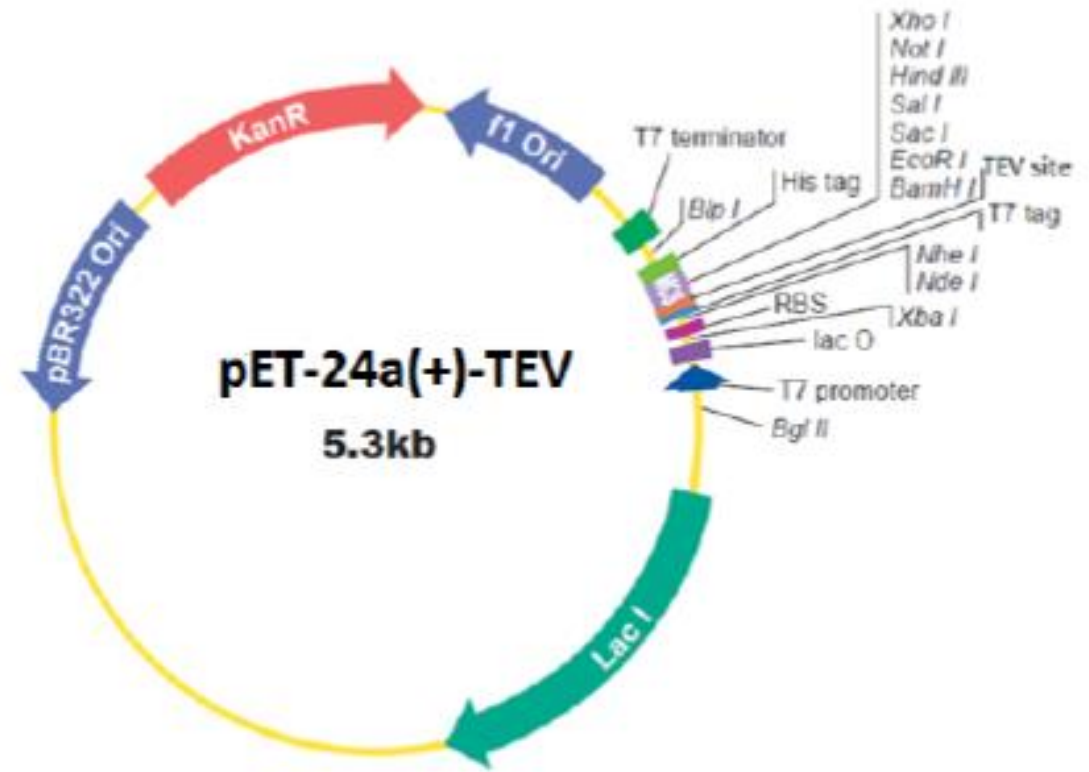
      Bgl II           T7 promoter           Xba I           rbs
--- A GAT CTC GAT CCC GCG AAA TTA ATA CGA CTC ACT ATA GGG AGA CCA CAA CGG TTT CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT
      Nde I   Nhe I   T7 tag           BamH I   EcoR I   Sac I   Sal I   Hind III   Not I   Xho I           His tag
ATA CAT ATG OCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CGC OGA TCC GAA TTC GAG CTC CGT CGA CAA GCT TGC GGC CGC ACT CGA OCA CCA CCA CCA CCA CTG AGA
      M   A   S   M   T   G   G   Q   Q   M   G   R   G   S   E   F   E   L   R   R   Q   A   C   G   R   T   R   A   P   P   P   P   L   R
      TCC GGC TGC TAA CAA AGC CCG AAA GGA AGC TGA GTT GGC TGC TGC CAC CGC TGA GCA ATA ACT AGC ATA ACC CCT TGG GGC CTC TAA ACG GGT CTT GAG GGG TTT TTT G ---
      S   G   C   stop
  
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pET-24a(+)



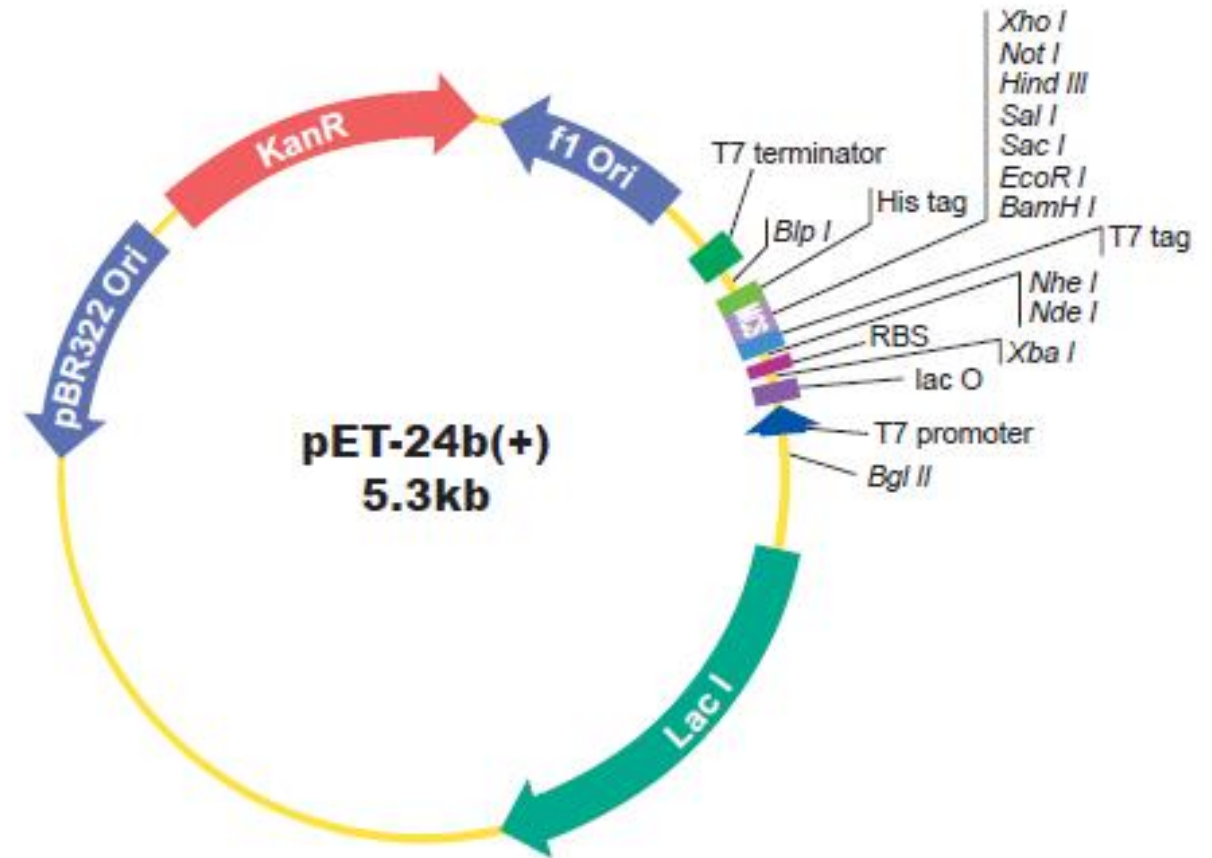
Bgl II T7 promoter lac operator *Xba I* rbs
 --- AGA TCT CGA TCC GGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AOC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT ---
Nde I *Nhe I* T7 tag *BamH I* *EcoR I* *Sac I* *Sal I* *Hind III* *Not I* *Xba I* His tag
 ATA CAT ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CGC GGA TCC GAA TTC GAG CTC CGT CGA CAA GCT TGC GGC CGC ACT CGA GCA CCA CCA CCA CCA CCA CTG AGA
 M A S M T G G Q Q M G R G S E F E L R R Q A C G R T R A P P P P P L R
Bsp I T7 terminator
 TCC GGC TGC TAA CAA AOC CCG AAA GGA AOC TGA GTT GGC TGC TGC CAC CGC TGA GCA ATA ACT AGC ATA ACC CCT TGG GGC CTC TAA ACG GGT CTT GAG GGG TTT TTT G ---
 S G C stop

pET-24a(+)-TEV



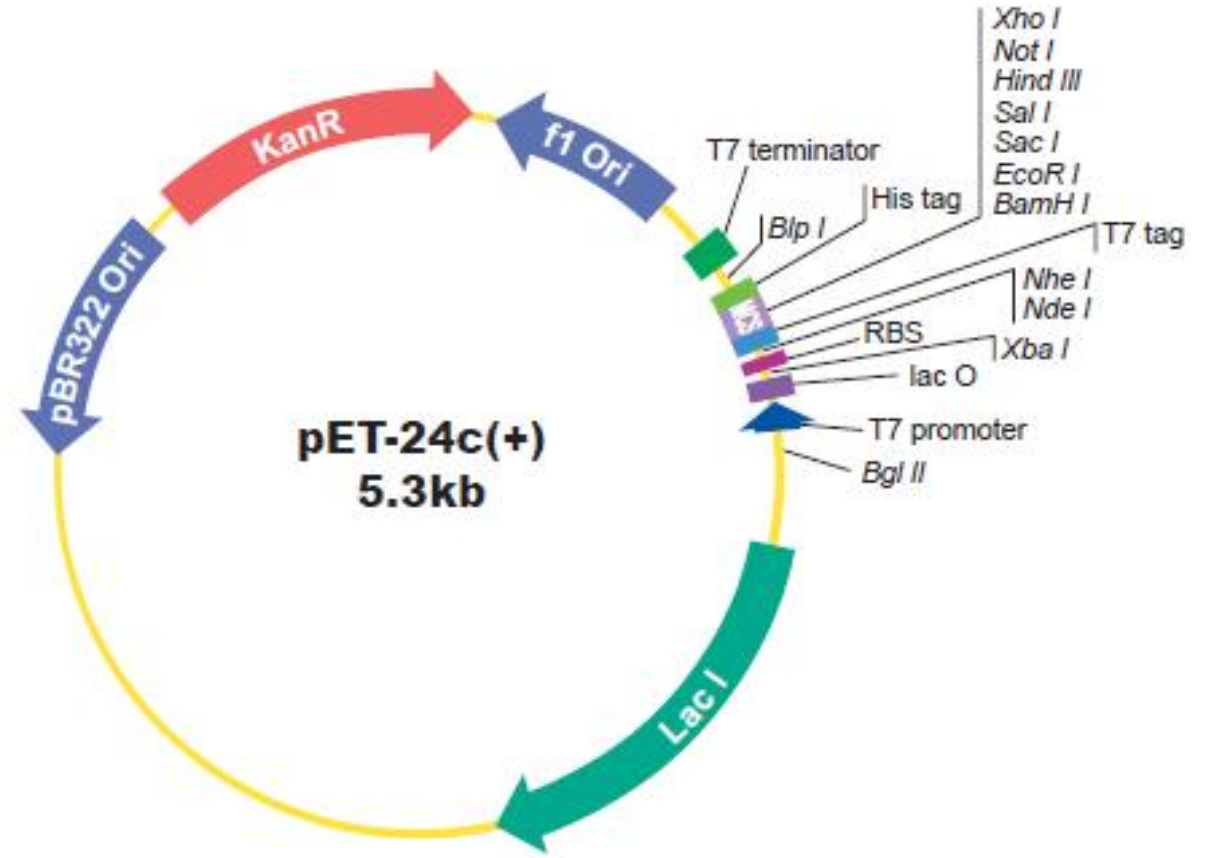
Bgl II T7 promoter lac operator
 ...AGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC
Xba I rbs *Nde I* *Nhe I* T7 tag
 CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT ATA CAT ATG GCT AGC ATG ACT GGT
 M A S M T G
 TEV site *BamHI* *EcoRI* *Sac I* *Sal I*
 GGA CAG CAA ATG GGT GAG AAT CTT TAT TTT CAG GGC GGA TCC GAA TTC GAG CTC CGT CGA CAA
 G Q Q M G E N L Y F Q G G S E F E L R R Q
Hind III *Not I* *Xho I* His tag
 GCT TGC GGC CGC ACT CGA GCA CCA CCA CCA CCA CTG AGA TCC GGC TGC TAA CAA AGC CCG
 A C G R T R A P P P P L R S G C Stop
Bip I T7 terminator
 AAA GGA AGC TGA GTT GGC TGC TGC CAC CGC TGA GCA ATA ACT AGC ATA ACC CCT TGG GGC CTC
 TAA ACG GGT CTT GAG GGG TTT TTT G...

pET-24b(+)



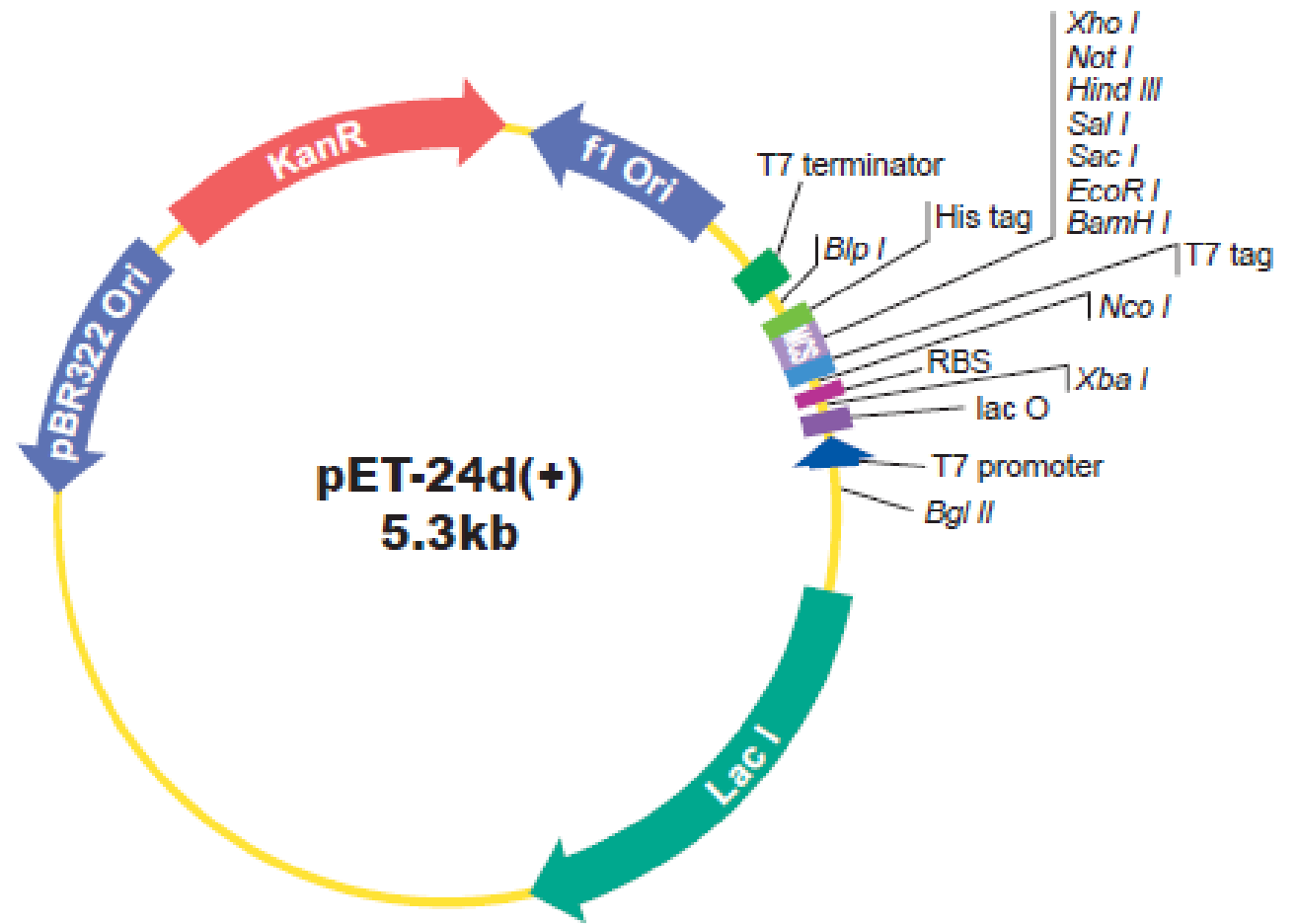
Bgl II T7 promoter lac operator *Xho I* rbs
 — AGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT ATA
Nde I *Nhe I* T7 tag *BamH I* *EcoR I* *Sac I* *Sal I* *Hind III* *Not I* *Xho I* His tag
 CAT ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CGG GAT CCG AAT TCG AGC TCC GTC GAC AAG CTT GCG GCC GCA CTC GAG CAC CAC CAC CAC CAC TGA GAT
 M A S M T G G Q Q M G R D F N S S S V D K L A A A L E H H H H H H stop
Bgl I T7 terminator
 CCG GCT GCT AAC AAA GCC CGA AAG GAA GCT GAG TTG GCT GCT GCC ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CGG GTC TTG ACG GGT TTT TTG —

pET-24c(+)



Bgl II T7 promoter lac operator *Xba I* rbs
 --- AGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GAT ATA ---
Nde I *Nhe I* T7 tag *BamH I* *EcoR I* *Sac I* *Sal I* *Hind III* *Nor I* *Xba I* His tag
 CAT ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT CGG ATC CGA ATT CGA GCT CCG TCG ACA AGC TTG CGG CCG CAC TCG AGC ACC ACC ACC ACC ACT GAG ATC
 M A S M T G G Q Q M G R I R I R A P S T S L R P H S S T T T T T E I
Bgl I T7 terminator
 CGG CTG CTA ACA AAG CCC GAA AGG AAG CTG AGT TGG CTG CTG CCA CCG CTG AGC AAT AAC TAG CAT AAC CCC TTG GGG CCT CTA AAC GGG TCT TGA GGG GTT TTT TG ---
 R L L T K P E R K L S W L L P P L S N N stop

pET-24d(+)

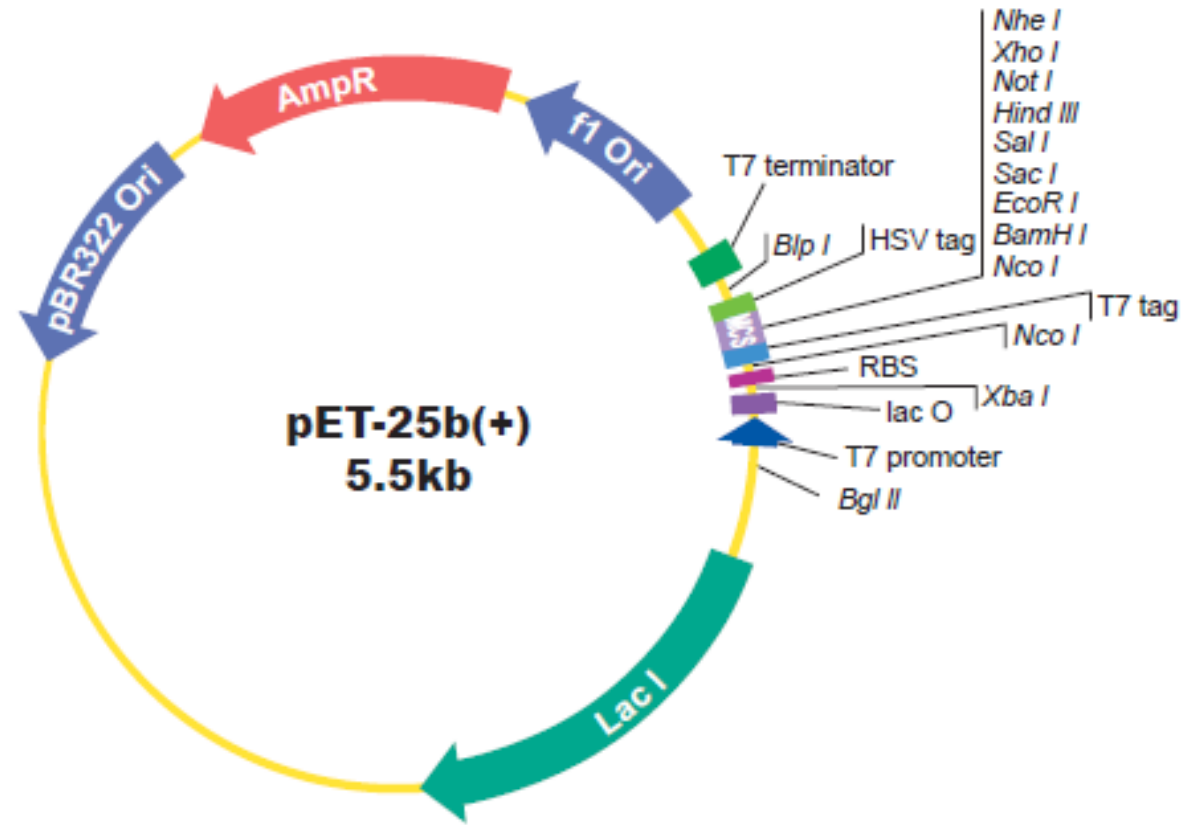


Bgl II *T7 promoter* *lac operator* *Xba I* *rbs*
 -- AG ATC TCG ATC CCG CGA AAT TAA TAC GAC TCA CTA TAG GGG AAT TGT GAG CCG ATA ACA ATT CCG CTC TAG AAA TAA TTT TGT TTA ACT TTA AGA AGG AGA TAT

Nco I **T7 tag** *BamH I* *EcoR I* *Sac I* *Sal I* *Hind III* *Not I* *Xho I* **His tag**
 ACC ATG OCT AGC ATG ACT OGT OGA CAG CAA ATG OGT CCG ATC CGA ATT CGA OCT CCG TCG ACA AOC TTG OGG CCG CAC TCG AGC ACC ACC ACC ACC ACC ACT GAG
 M A S M T G G Q Q M G R I R I R A P S T S L R P H S S T T T T T E

Bgl I *T7 terminator*
 ATC CCG CTG CTA ACA AAG CCC GAA AGG AAG CTG AGT TGG CTG CTG CCA CCG CTG ACC AAT AAC TAG CAT AAC CCC TTG GGG CCT CTA AAC GGG TCT TGA GGG GTT TTT TG ---
 I R L L T K P E R K L S W L L P P L S N N Stop

pET-25b(+)



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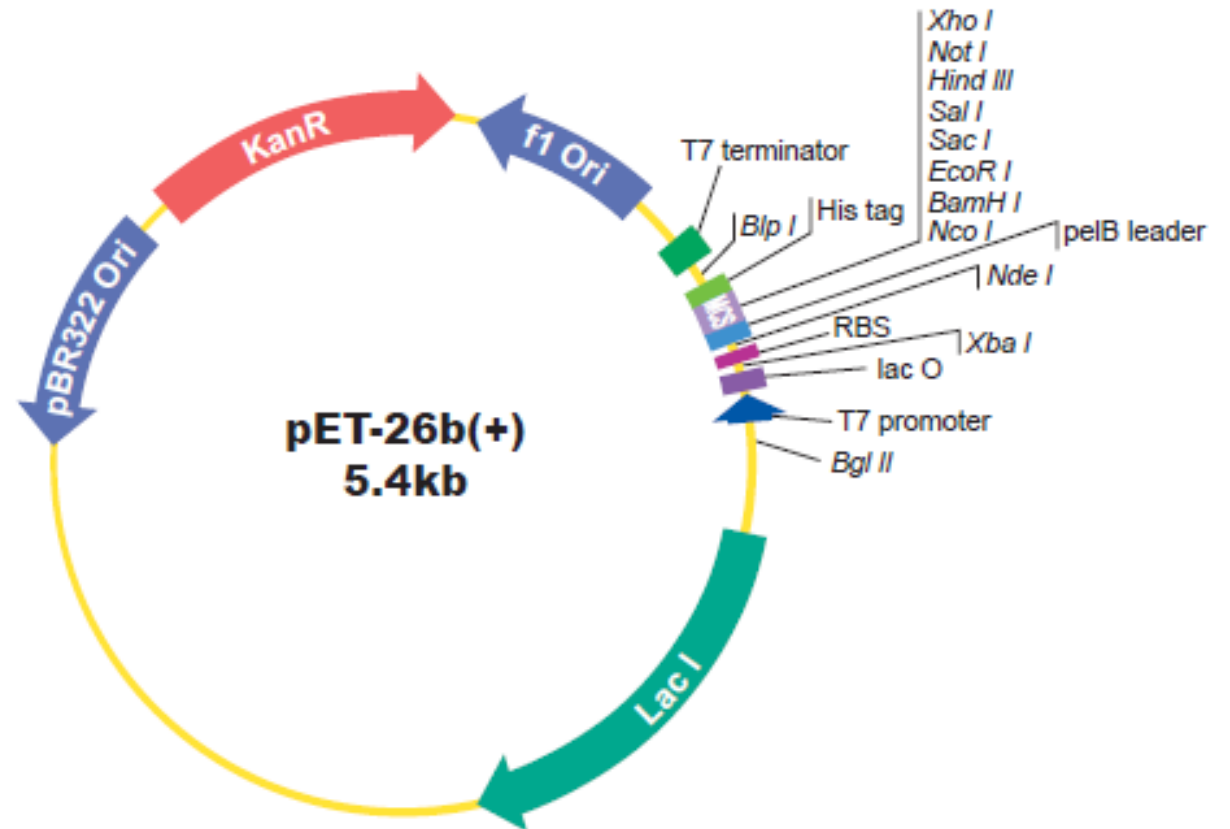
      Bgl II           T7 promoter           lac operator           Xba I           rbs
--- AGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT

      Nde I           pcIB leader           Nco I           BamH I   EcoR I   Sac I
ATA CAT ATG AAA TAC CTG CTG CCG ACC GCT GCT GCT GGT CTG CTG CTC CTC GCT GGC CAG CCG GCG ATG GCC ATG GAT ATC GGA ATT AAT TCG GAT CCG AAT TCG AGC TCC
      M  K  Y  L  L  P  T  A  A  A  G  L  L  L  L  A  A  Q  P  A  M  A  M  D  I  G  I  N  S  D  P  N  S  S  S

      Sal I   Hind III   Not I   Xho I           Nhe I           HSV tag           His tag
GTC GAC AAG CTT GCG GCC GCA CTC GAG ATC AAA CCG GCT AGC CAG CCA GAA CTC GGC CCG GAA GAC CCC GAG GAT GTC GAG CAC CAC CAC CAC CAC TGA GAT CCG GCT
      V  D  K  L  A  A  A  L  E  I  K  R  A  S  Q  P  E  L  A  P  E  D  P  E  D  V  E  H  H  H  H  H  H  Ssp

      Bsp I           T7 terminator
GCT AAC AAA GCC CGA AAG GAA GCT GAG TTG GCT GCT GCC ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CCG GTC TTG AGG GGT TTT TTG ---
  
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pET-26b(+)



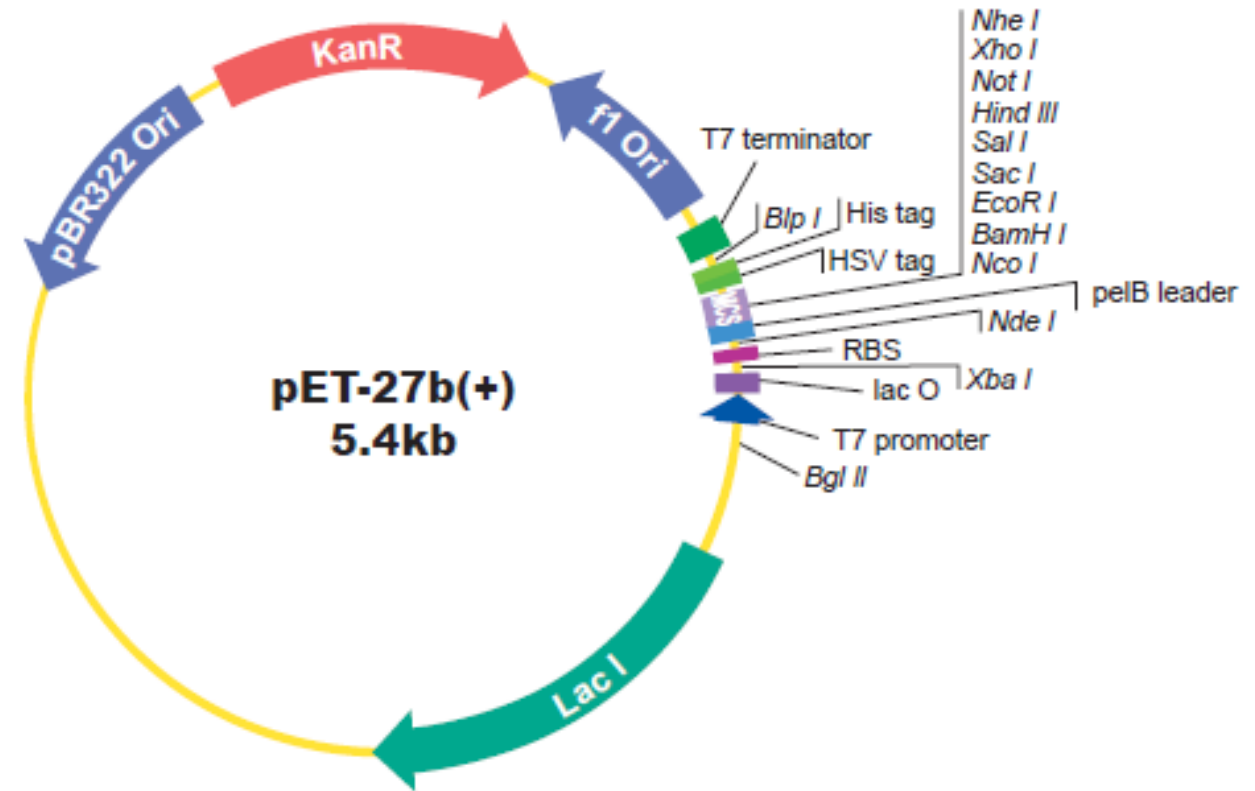
Bgl II T7 promoter lac operator Xba I rbs
 --- AGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT

Nde I pelB leader Nco I BamH I EcoR I Sac I
 ATA CAT ATG AAA TAC CTG CTG CCG ACC GCT GCT GCT GGT CTG CTG CTC CTC GCT GCC CAG CCG GCG ATG GCC ATG GAT ATC GGA ATT AAT TCG GAT CCG AAT TCG AGC TCC
 M K Y L L P T A A A G L L L L A A Q P A M A M D I G I N S D P N S S S

Saf I *Hind III* *Nor I* *Xho I* His tag *Bsp I*
 GTC GAC AAG CTT GCG GCC GCA CTC GAG CAC CAC CAC CAC CAC TGA GAT CCG GCT GCT AAC AAA GCC CGA AAG GAA GCT GAG TTG GCT GCT GCC ACC GCT GAG CAA
 V D K L A A A L E H H H H H H Stop

T7 terminator
 TAA CTA GCA TAA CCC CTT GGG GGC TCT AAA CGG GTC TTG AGG GGT TTT TTG ---

pET-27b(+)



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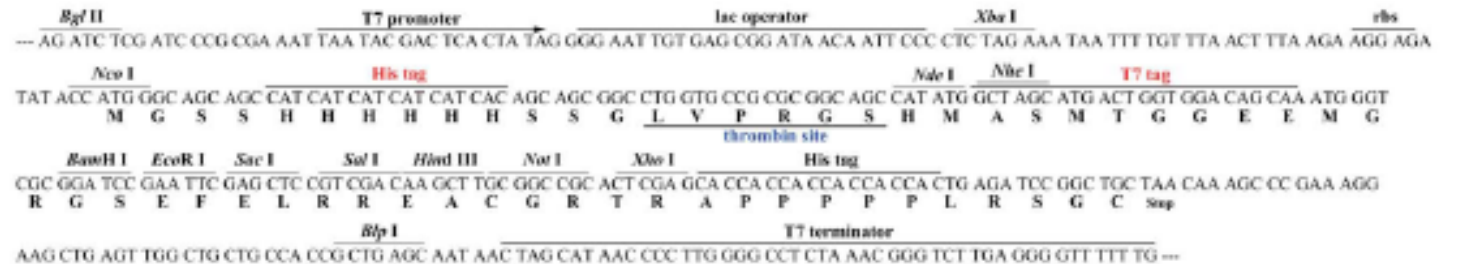
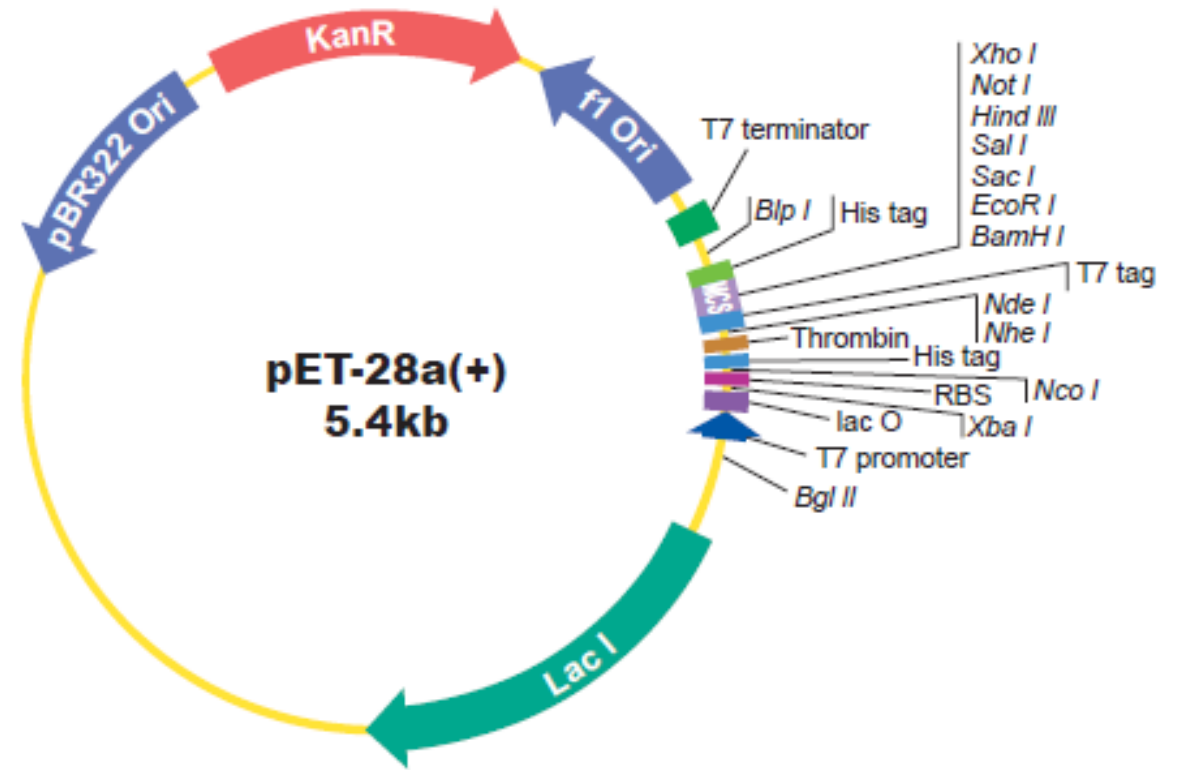
      Bgl II          T7 promoter          lac operator          Xba I          rbs
--- AGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT

      Nde I          pelB leader          Nco I          BamH I    EcoR I    Sac I
ATA CAT ATG AAA TAC CTG CTG CCG ACC GCT GCT GCT GGT CTG CTG CTC CTC GCT GCC CAG CCG GCG ATG GCC ATG GAT ATC GGA ATT AAT TCG GAT CCG AAT TCG AGC TCC
      M  K  Y  L  L  P  T  A  A  A  G  L  L  L  L  A  A  Q  P  A  M  A  M  D  I  G  I  N  S  D  P  N  S  S  S

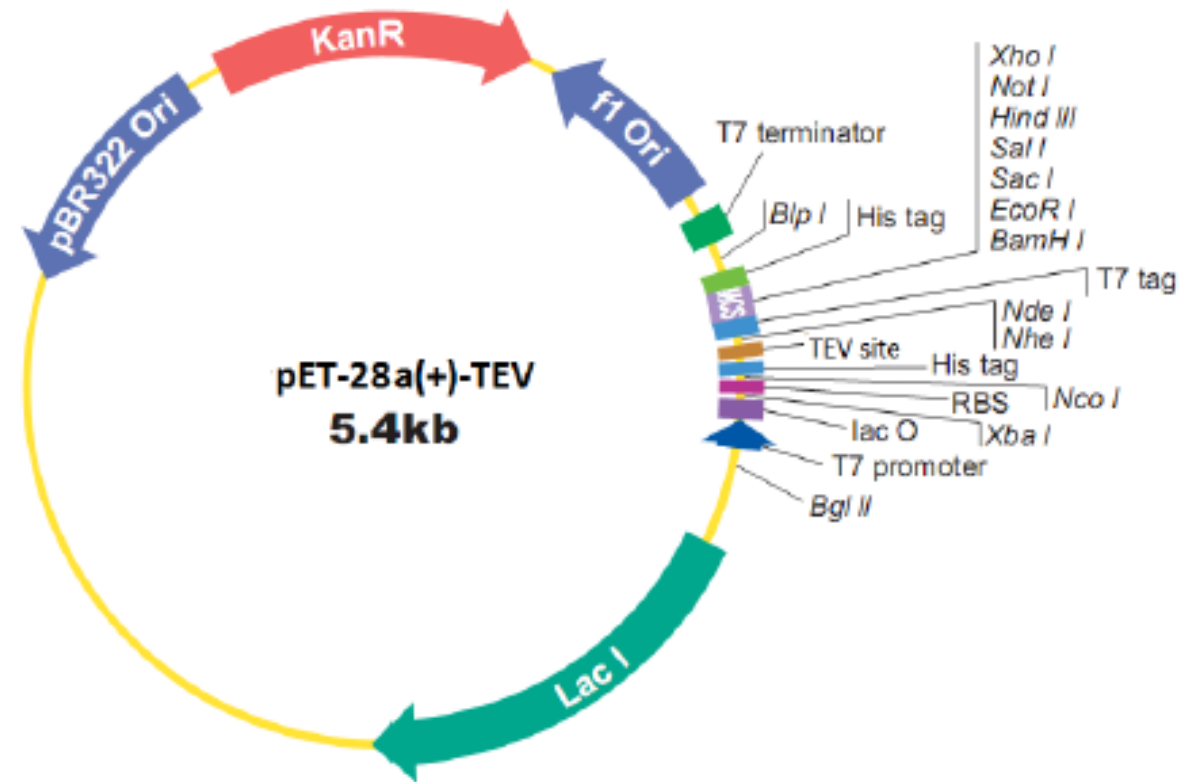
      Sal I    Hind III    Not I    Xho I          Nhe I          HSV tag          His tag
GTC GAC AAG CTT GCG GCC GCA CTC GAG ATC AAA CCG GCT AGC CAG CCA GAA CTC GCC CCG GAA GAC CCG GAG GAT GTC GAG CAC CAC CAC CAC CAC TGA GAT CCG GCT
      V  D  K  L  A  A  A  L  E  I  K  R  A  S  Q  P  E  L  A  P  E  D  P  E  D  V  E  H  H  H  H  H  Stop

      Bsp I          T7 terminator
GCT AAC AAA GCC CGA AAG GAA GCT GAG TTG GCT GCT GCC ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CCG GTC TTG AGG GGT TTT TTG --
  
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pET-28a(+)



pET-28a(+)-TEV



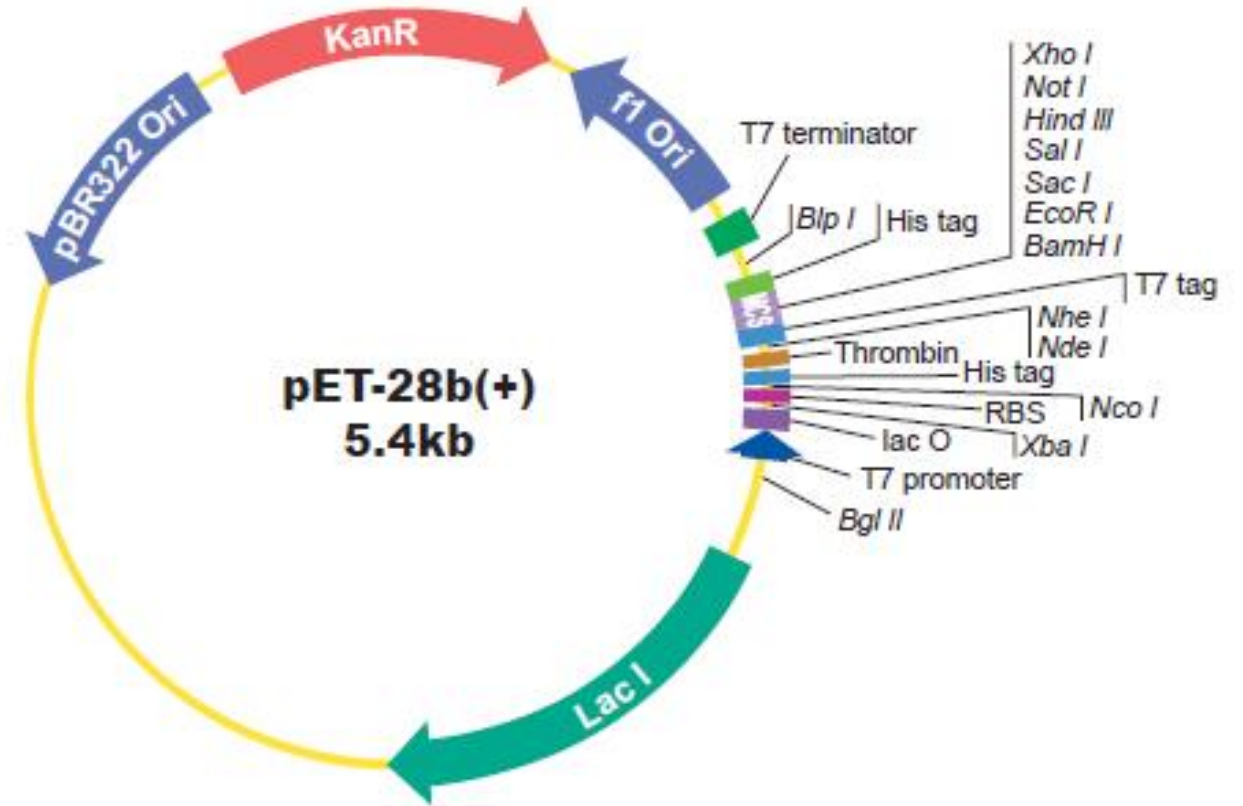
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      BglII          T7 promoter          lac operator          XbaI          rbs
--- AG ATC TCG ATC COG CGA AAT TAA TAC GAC TCA CTA TAG GGG AAT TGT GAG CCG ATA ACA ATT CCC CTC TAG AAA TAA TTT TGT TTA ACT TTA AGA AGG AGA

      NcoI          His tag          NdeI  NheI          T7 tag
TAT ACC ATG GGC AGC AGC CAT CAT CAT CAT CAC AGC AGC GGC GAG AAT CTT TAT TTT CAG GGC CAT ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT
      M G S S H H H H H S S G E N L Y F Q S H M A S M T G G E E M G
                                TEV site
      BamHI  EcoRI  SacI  SalI  Hind III  NotI  XhoI          His tag
CGC GGA TCC GAA TTC GAG CTC CGT CGA CAA GCT TGC GGC CGC ACT CGA GCA CCA CCA CCA CCA CCA CTG AGA TCC GGC TGC TAA CAA AGC CC GAA AGG
R G S E F E L R R E A C G R T R A P P P P P L R S G C stop

      BspI          T7 terminator
AAG CTG ACT TGG CTG CTG CCA CCG CTG AGC AAT AAC TAG CAT AAC CCC TTG GGG CCT CTA AAC GGG TCT TGA GGG GTT TTT TG ---
  
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pET-28b(+)



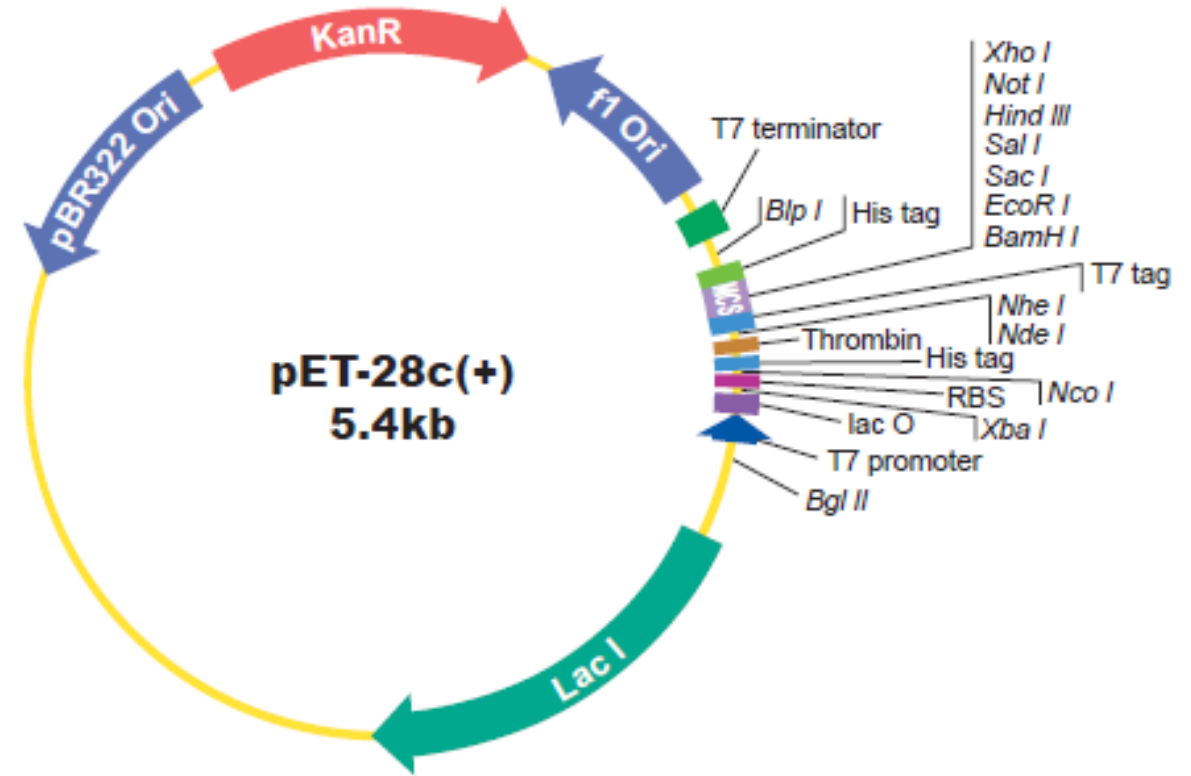
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      Bgl II          T7 promoter          lac operator          Xba I          rbs
--- AG ATC TCG ATC CCG CGA AAT TAA TAC GAC TCA CTA TAG GGG AAT TGT GAG CGG ATA ACA ATT CCC CTC TAG AAA TAA TTT TGT TTA ACT TTA AGA AGG AGA

      Nco I          His tag          Nde I          Nhe I          T7 tag
TAT ACC ATG GGC AGC AGC CAT CAT CAT CAT CAT CAC AGC AGC GGC CTG GTG CCG CGC GGC AGC CAT ATG GCT AGC ATG ACT GGT GGA CAG CAA ATG GGT
      M G S S H H H H H S S G L V P R G S H M A S M T G G E E M G
                                     thrombin site
      BamH I  EcoR I  Sac I  Sal I  Hind III  Not I  Xho I          His tag
CGG GAT CCG AAT TCG AGC TCC GTC GAC AAG CTT GCG GCC GCA CTC GAG CAC CAC CAC CAC CAC TGA GAT CCG GCT GCT AAC AAA GCC CGA AAG GAA
      R D P N S S S V D K L A A A L E H H H H H H Stop

      Bgl I          T7 terminator
GCT GAG TTG GCT GCT GCC ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CGG GTC TTG AGG GGT TTT TTG ---
  
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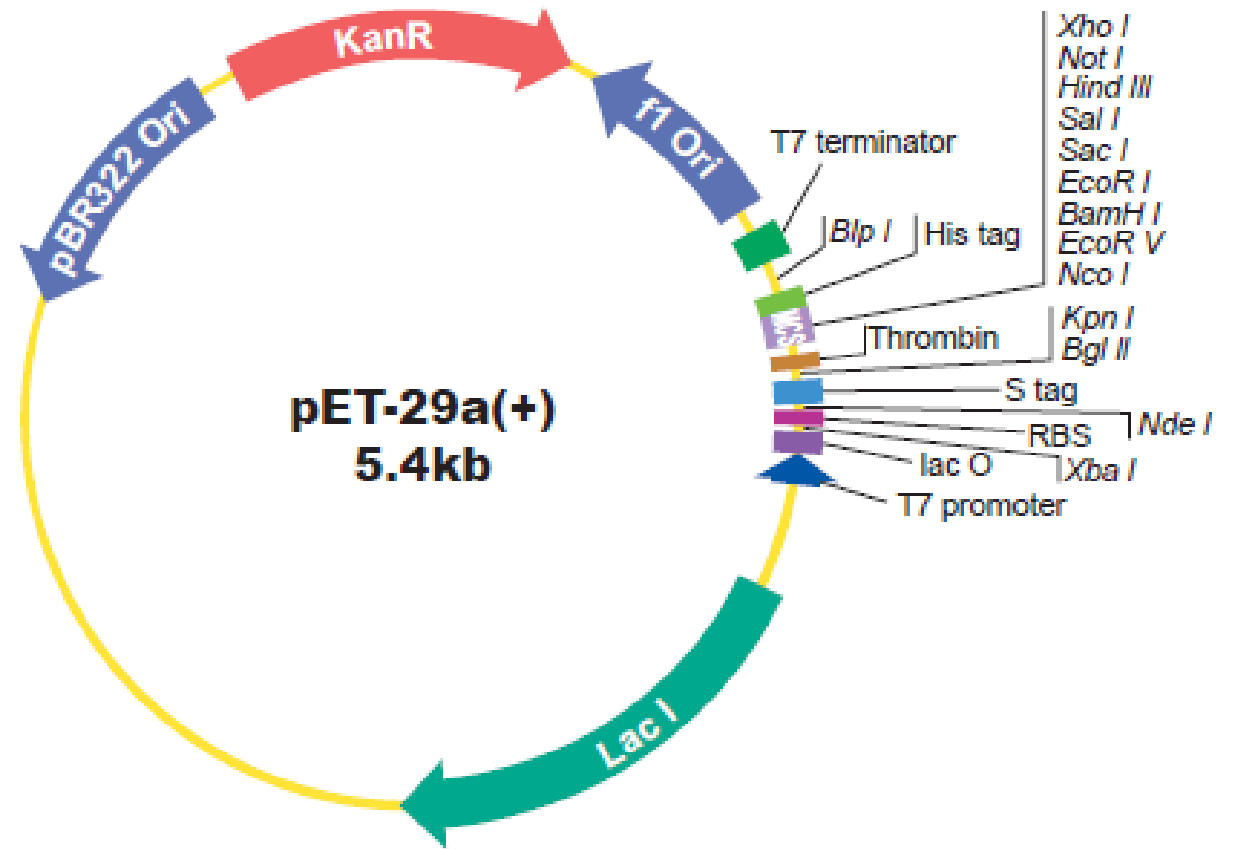
pET-28c(+)



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      Bgl II          T7 promoter          lac operator          Xba I          rbs
--- AG ATC TCG ATC CCG CGA AAT TAA TAC GAC TCA CTA TAG GGG AAT TGT GAG CGG ATA ACA ATT CCC CTC TAG AAA TAA TTT TGT TTA ACT TTA AGA AGG AGA
      Nco I          His tag          Nde I          Nhe I          T7 tag
TAT ACC ATG GGC AGC AGC CAT CAT CAT CAT CAC AGC AGC GGC CTG GTG CCG CGC GGC AGC CAT ATG GCT AGC ATG ACT GGT OGA CAG CAA ATG GGT
      M G S S H H H H H S S G L V P R G S H M A S M T G G E E M G
                                     thrombin site
      BamH I   EcoR I   Sac I   Sal I   Hind III   Not I   Xba I          His tag
CGG ATC CGA ATT CGA GCT CCG TCG ACA AGC TTG CCG CCG CAC TCG AGC ACC ACC ACC ACC ACT GAG ATC CCG CTG CTA ACA AAG CCC GAA AGG AAG
      R I R I R A P S T S L R P H S S T T T T T T T E I R L L T K P E R K
      Bln I          T7 terminator
CTG AGT TGG CTG CTG CCA CCG CTG AGC AAT AAC TAG CAT AAC CCC TTG GGG CCT CTA AAC GGG TCT TGA GGG GTT TTT TG ---
      L S W L L P P L S N N Stop
  
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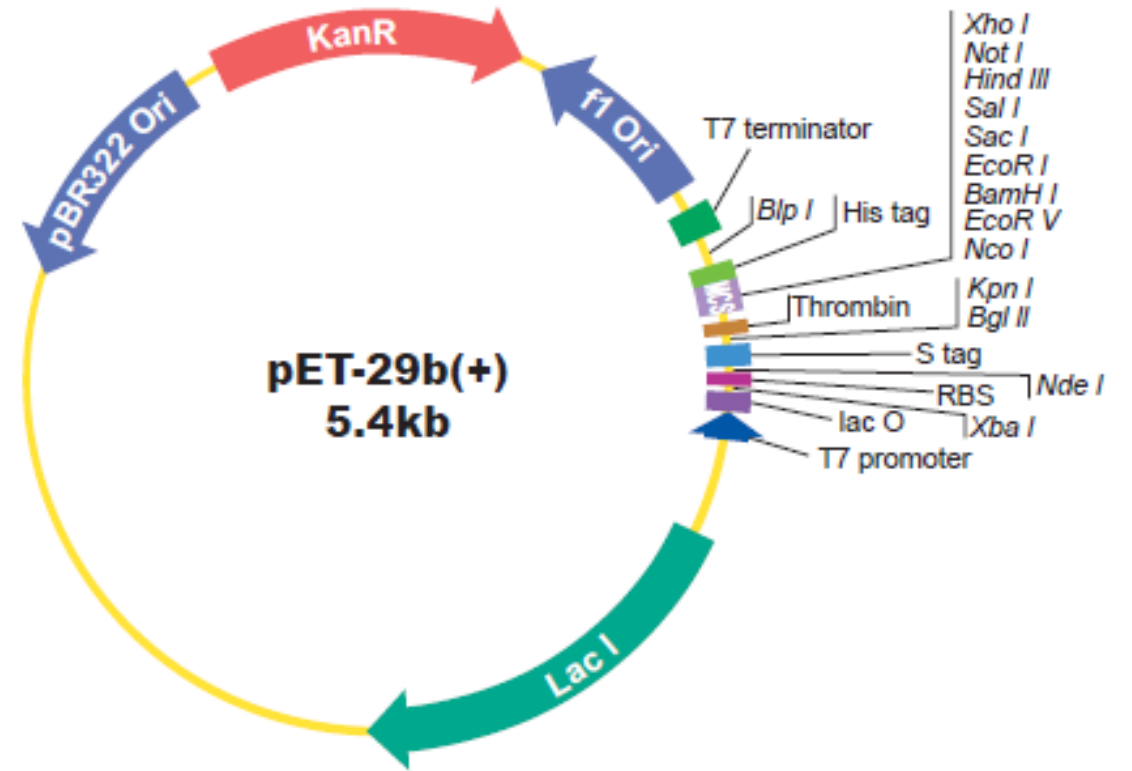
pET-29a(+)



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--- A GAT CGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCG TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT
                                     T7 promoter          lac operator          Xba I          rbs
ATA CAT ATG AAA GAA ACC GCT GCT GCT AAA TTC GAA CGC CAG CAC ATG GAC AGC CCA GAT CTG GGT ACC CTG GTG CCA CGC GGT TCC ATG GCT GAT ATC GGA TCC
Nde I          S tag          Bgl II          Kpn I          Nco I          EcoR V          BamH I
M K E T A A A K F E R Q H M D S P D L G T L V P R G S M A D I G S
                                     thrombin site
GAA TTC GAG CTC CGT CGA CAA GCT TGC GGC CGC ACT CGA GCA CCA CCA CCA CCA CCA CTG AGA TCC GGC TGC TAA CAA AGC CC GAA AGG AAG CTG AGT TGG CTG
E F E L R R Q A C G R T R A P P P P P L R S G C Stop
Bsp I          T7 terminator
CTG CCA CCG CTG AGC AAT AAC TAG CAT AAC CCC TTG GGG CCT CTA AAC GGG TCT TGA GGG GTT TTT TG ---
    
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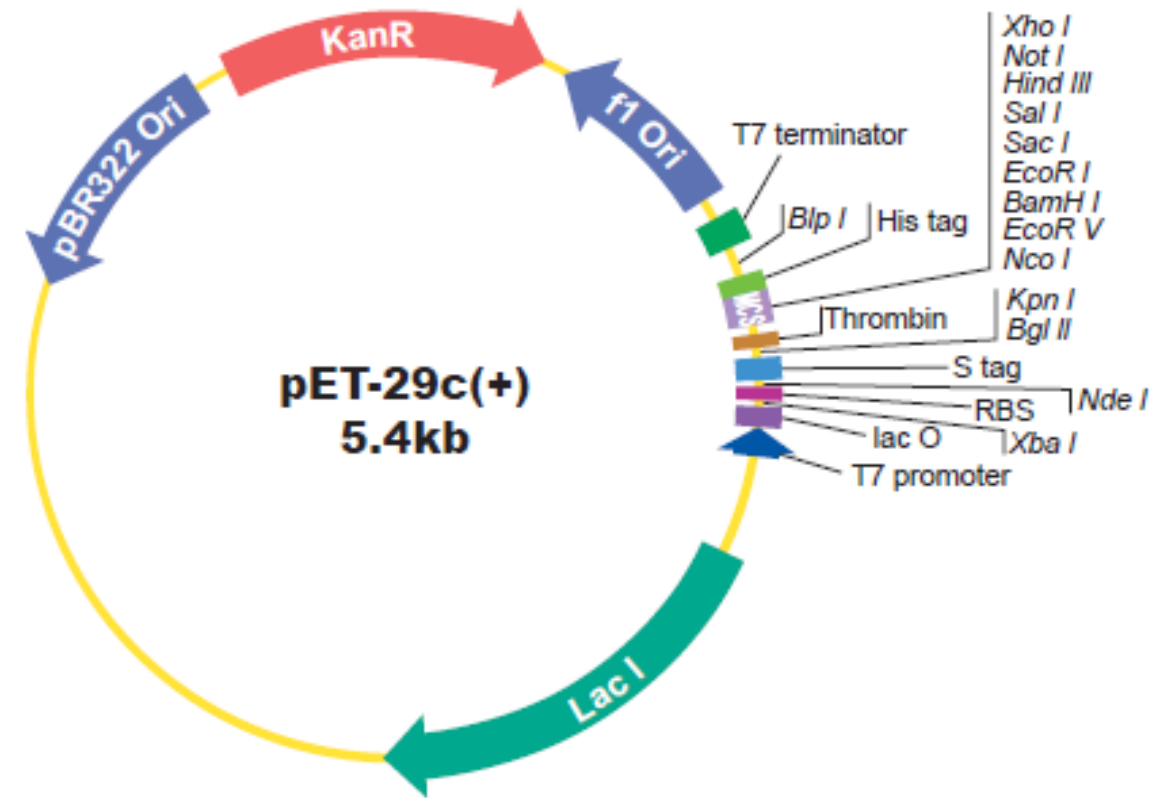

pET-29b(+)



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-- A GAT CGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TEC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT
      T7 promoter          lac operator          Xba I          rbs
ATA CAT ATG AAA GAA ACC GCT GCT GCT AAA TTC GAA CGC CAG CAC ATG GAC AGC CCA GAT CTG GGT ACC CTG GTG CCA CGC GGT TCC ATG GCG ATA TCG GAT CCG
      Nde I          S tag          Bgl II          Kpn I          Nco I          EcoR V          BamH I
      M K E T A A A K F E R Q H M D S P D L G T L V P R G S M A I S D P
AAT TCG AOC TCC GTC GAC AAG CTT GCG GCC GCA CTC GAG CAC CAC CAC CAC CAC TGA GAT CCG OCT GCT AAC AAA OCC CGA AAG GAA GCT GAG TTG GCT GCT
      EcoR I          Sac I          Sal I          Hind III          Not I          Xho I          His tag
      N S S S V D K L A A A L E H H H H H H Stop
      Bsp I          T7 terminator
GCC ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CGG GTC TTG AGG GGT TTT TTG ---
  
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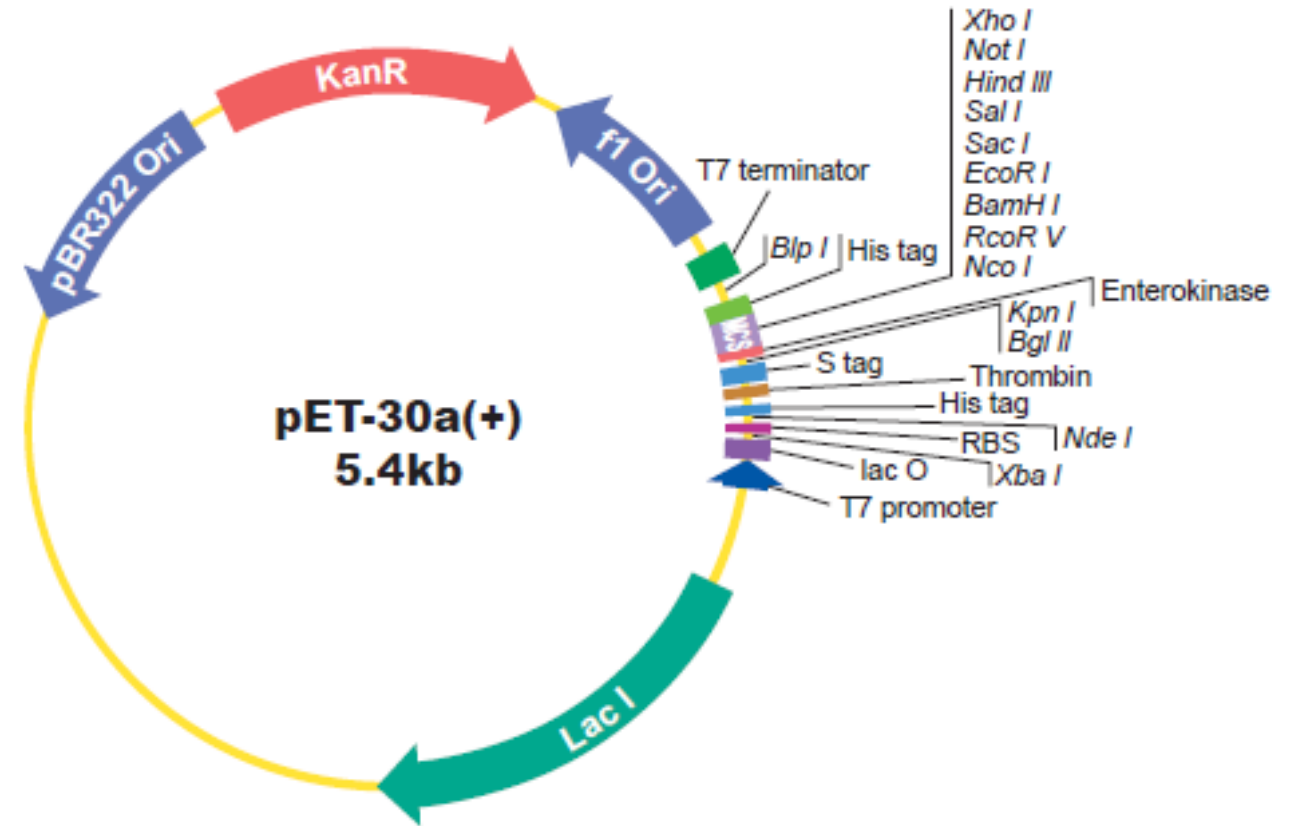
pET-29c(+)



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--- A GAT CGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT
      T7 promoter          lac operator          Xba I          rbs
      Nde I          S tag          Bsp I          Kpn I          Nco I          EcoRV          BamHI
ATA CAT ATG AAA GAA ACC GCT GCT GCT AAA TTC GAA CGC CAG CAC ATG GAC AGC CCA GAT CTG GGT ACC CTG GTG CCA CGC GGT TCC ATG GGA TAT CTG TGG ATC
      M K E T A A A K F E R Q H M D S P D L G T L V P R G S M G Y L W I
      EcoRI          Sac I          Sal I          Hind III          Not I          Xba I          His tag
CGA ATT CGA GCT CCG TCG ACA AGC TFG CCG CCG CAC TCG AGC ACC ACC ACC ACC ACT GAG ATC CCG CTG CTA ACA AAG CCC GAA AGG AAG CTG AGT TGG CTG
      R I R A P S T S L R P H S S Y T T T T T E I R L L T K P E R K L S W L
      Bsp I          T7 terminator
CTG CCA CCG CTG AGC AAT AAC TAG CAT AAC CCC TTG GGG CCT CTA AAC GGG TCT TGA GGG GTT TTT TG ---
      L P P L S N N Stop
  
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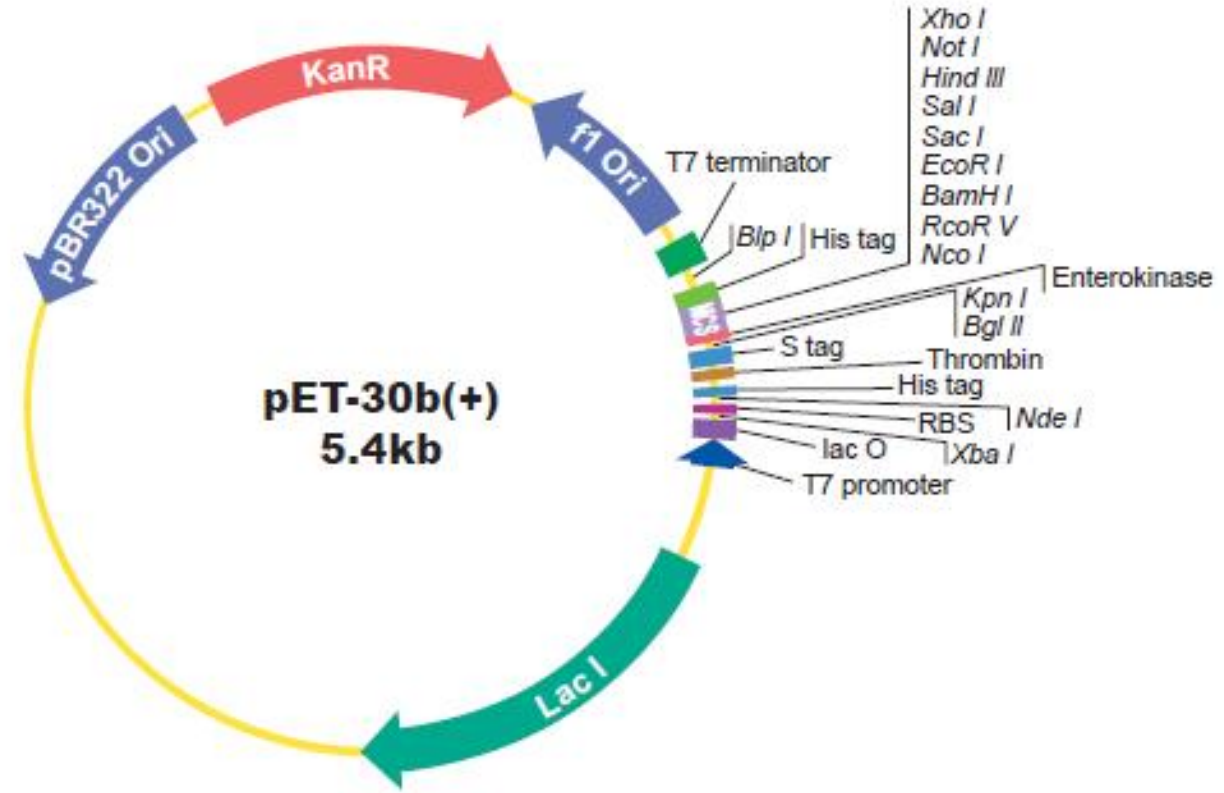
pET-30a(+)



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--- A GAT CGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT
      Nde I      His tag
ATA CAT ATG CAC CAT CAT CAT CAT CAT TCT TCT GGT CTG GTG CCA CGC GGT TCT GGT ATG AAA GAA ACC OCT GCT GCT AAA TTC GAA CGC CAG CAC ATG GAC AGC CCA
      M H H H H H H S S G L V P R G S G M K E T A A A K F E R Q H M D S P
      thrombin site
Bgl II  Kpn I      Nco I  EcoR V  BamH I  EcoR I  Sac I  Sal I  Hind III  Not I  Xho I      His tag
GAT CTG GGT ACC GAC GAC GAC GAC AAG GCC ATG OCT GAT ATC GGA TCC GAA TTC GAG CTC CGT CGA CAA GCT TGC GGC CGC ACT CDA GCA CCA CCA CCA CCA CCA CTG
D L G T D D D D K A M A D I G S E F E L R R Q A C G R T R A P P P P P L
AGT TCC GGC TGC TAA CAA AGC CC GAA AGG AAG CTG AGT TGG CTG CTG CCA CCG CTG AGC AAT AAC TAG CAT AAC CCC TTG GGG OCT CTA AAC GGG TCT TGA GGG GTT TTT TG ---
      Bsp I      T7 terminator
R S G C stop
  
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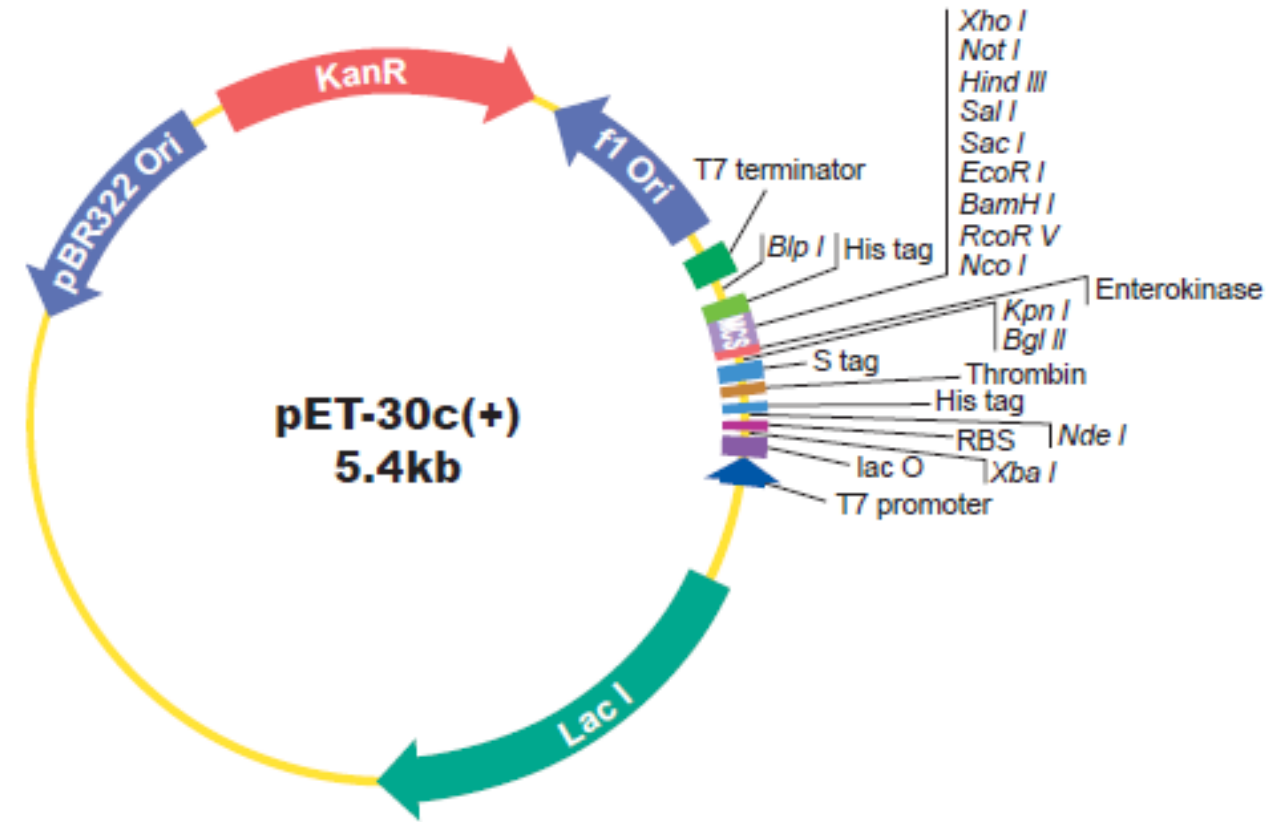
pET-30b(+)



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— A GAT CGA TCT CGA TCC CCG GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC ECC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT
      T7 promoter                                lac operator                                Xba I                                rbs
ATA CAT ATG CAC CAT CAT CAT CAT CAT TCT TCT GGT CTG GTG CCA CGC GGT TCT GGT ATG AAA GAA ACC OCT GCT OCT AAA TTC GAA CCG CAG CAC ATG GAC AGC CCA
      Nde I                                His tag                                S tag
      M H H H H H H S S G L V P R G S G M K E T A A A K F E R Q H M D S P
                                thrombin site
Bgl II  Kpn I                                Nco I  EcoR V  BamH I  EcoR I  Sac I  Sal I  Hind III  Nco I  Xba I  His tag
GAT CTG GGT ACC GAC GAC GAC AAG GCC ATG GCG ATA TCG GAT CCG AAT TCG AGC TCC GTC GAC AAG CTT GCG GCC GCA CTC GAG CAC CAC CAC CAC CAC TGA
D L G T D D D K A M A I S D P N S S S V D K L A A A L E H H H H H H S P
                                Bip I                                T7 terminator
GAT CCG GCT GCT AAC AAA GCC CGA AAG GAA GCT GAG TTG GCT GCT GCC ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CCG GTC TTG AGG GGT TTT TTG —
  
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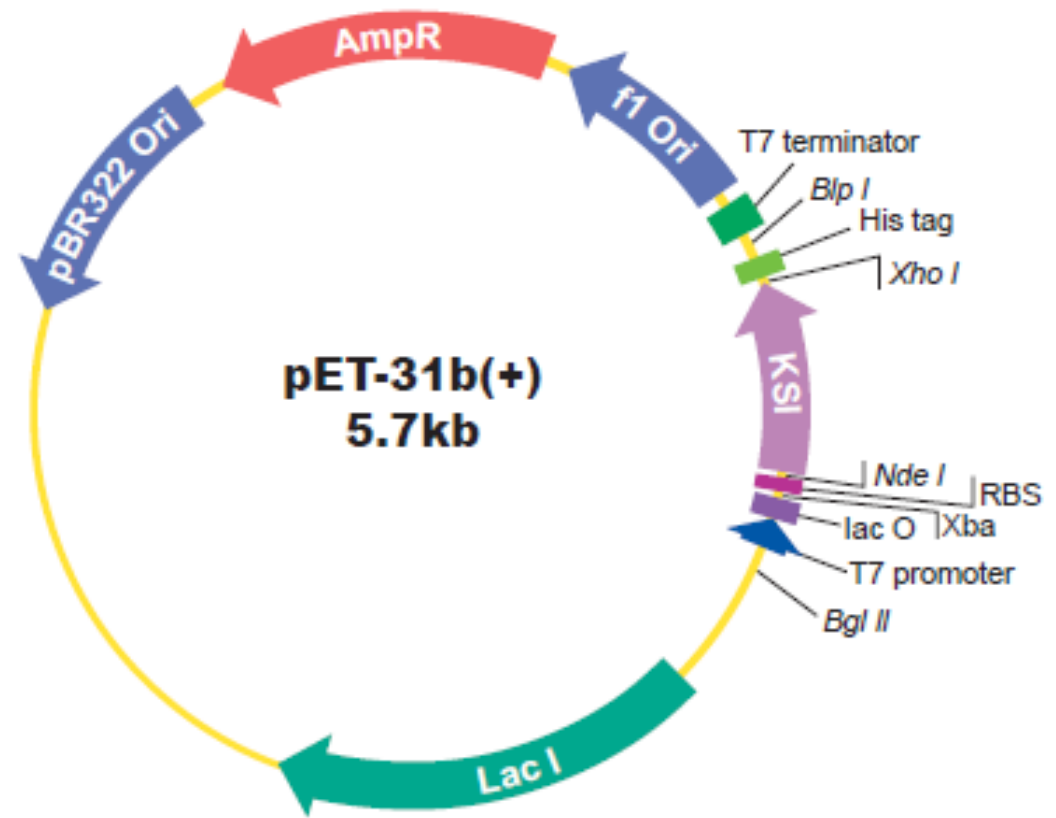
pET-30c(+)



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--- A GAT CGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT ATA
T7 promoter          lac operator          Xba I          rbs
Nde I          His tag          S tag          Bgl II
CAT ATG CAC CAT CAT CAT CAT CAT TCT TCT GGT CTG GTG CCA CGC GGT TCT GGT ATG AAA GAA ACC GCT GCT GCT AAA TTC GAA CGC CAG CAC ATG GAC AGC CCA GAT CTG
M H H H H H H S S G L V P R G S G M K E T A A A K F E R Q H M D S P D L
          thrombin site
Kpn I          Nco I          EcoR V          BamH I          EcoR I          Sac I          Sal I          Hind III          Nar I          Xba I          His tag
GGT ACC GAC GAC GAC GAC AAG GCC ATG GGA TAT CTG TGG ATC CGA ATT CGA GCT CCG TUG ACA AGC TTG CGG CCG CAC TGG AGC ACC ACC ACC ACC ACT GAG ATC CGG
G T D D D D K A M G Y L W I R I R A P S T S L R P H S S T T T T T T E I R
          Bsp I          T7 terminator
CTG CTA ACA AAG CCC GAA AGG AAG CTG AGT TGG CTG CTG CCA CCG CTG AGC AAT AAC TAG CAT AAC CCC TTG GGG CCT CTA AAC GGG TCT TGA GGG GTT TTT TG ---
  
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pET-31b(+)

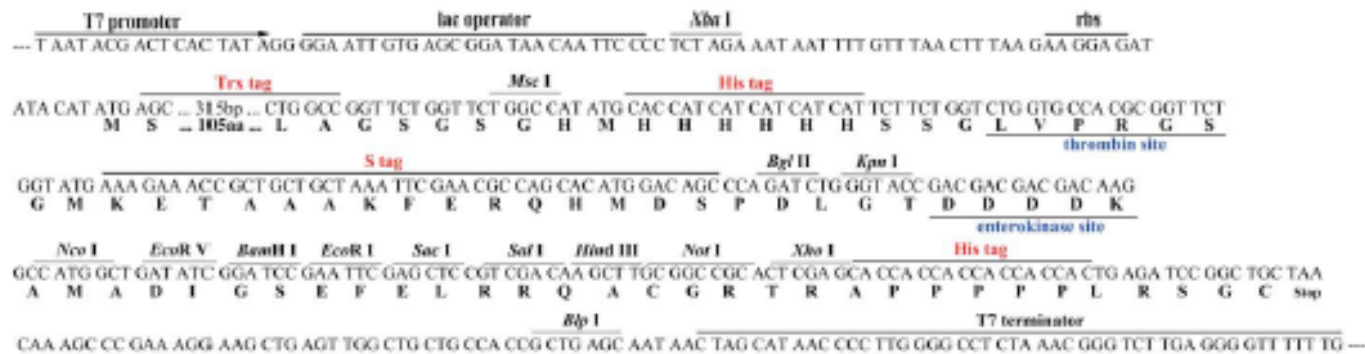
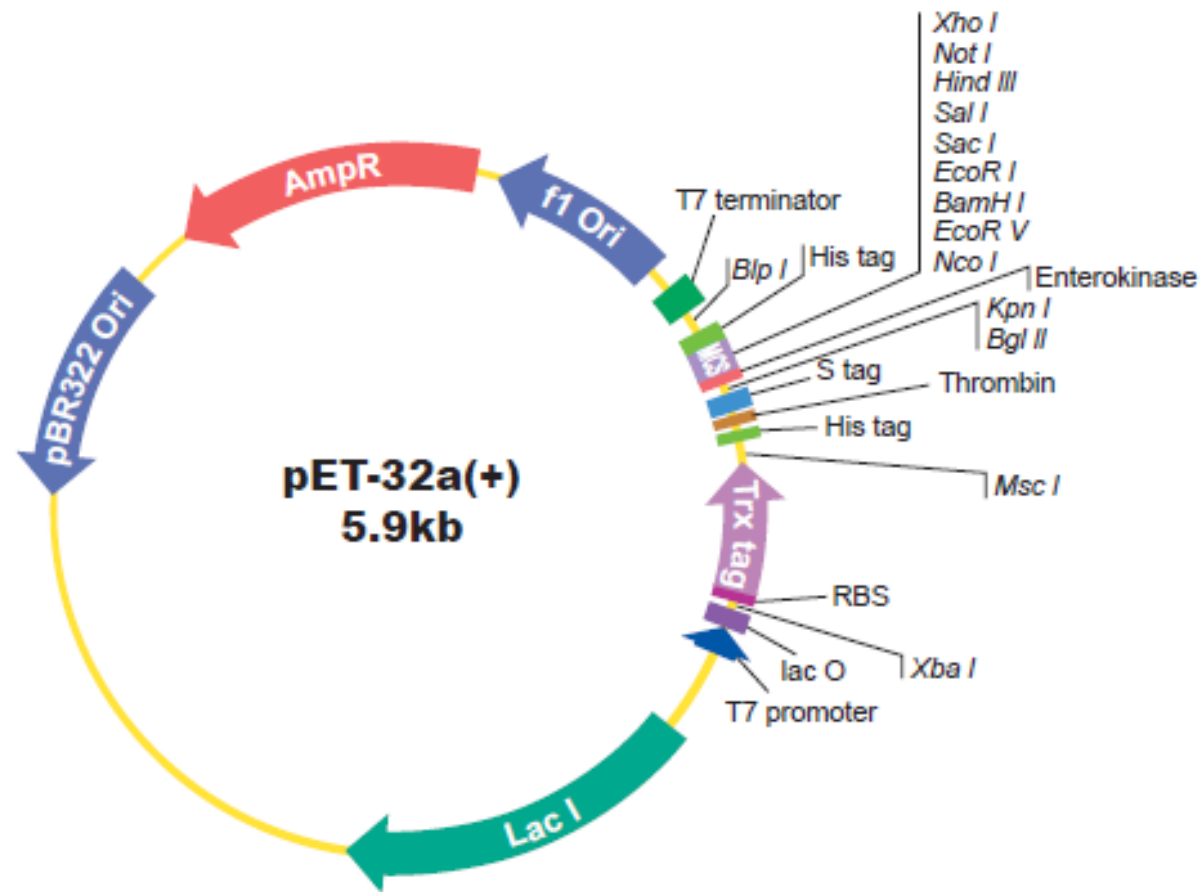


Bgl II T7 promoter lac operator *Xho I* rbs
 --- AGA TCT CGA TCC CGC GAA ATT AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT ---

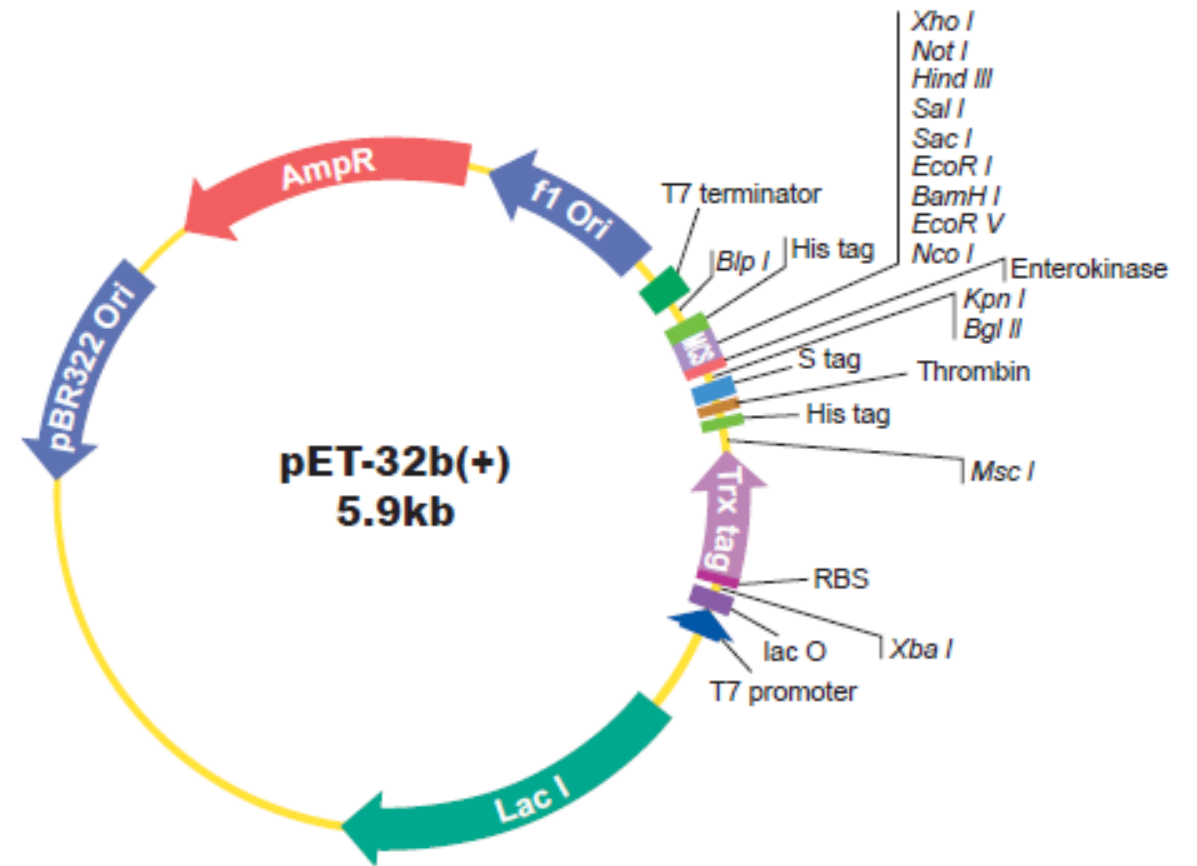
Nde I KSI *Xho I* His tag
 ATA CAT ATG ... 315bp ... GGC AAG GTG GTG AGC ATC CGC GCC TTG TTT GGC GAG AAG AAT ATT CAC GCA TGC CAG ATG CTG CTC GAG CAC CAC CAC CAC CAC CAC TGA GAT
 M ... 105aa ... G K V V S I R A L F G E K N I H A C Q M L L E H H H H H H Ssp

Bgl I T7 terminator
 CCG GCT GCT AAC AAA GCC CGA AAG GAA GCT GAG TTG GCT GCT GCC ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CGG GTC TTG AGG GGT TTT TTG ---

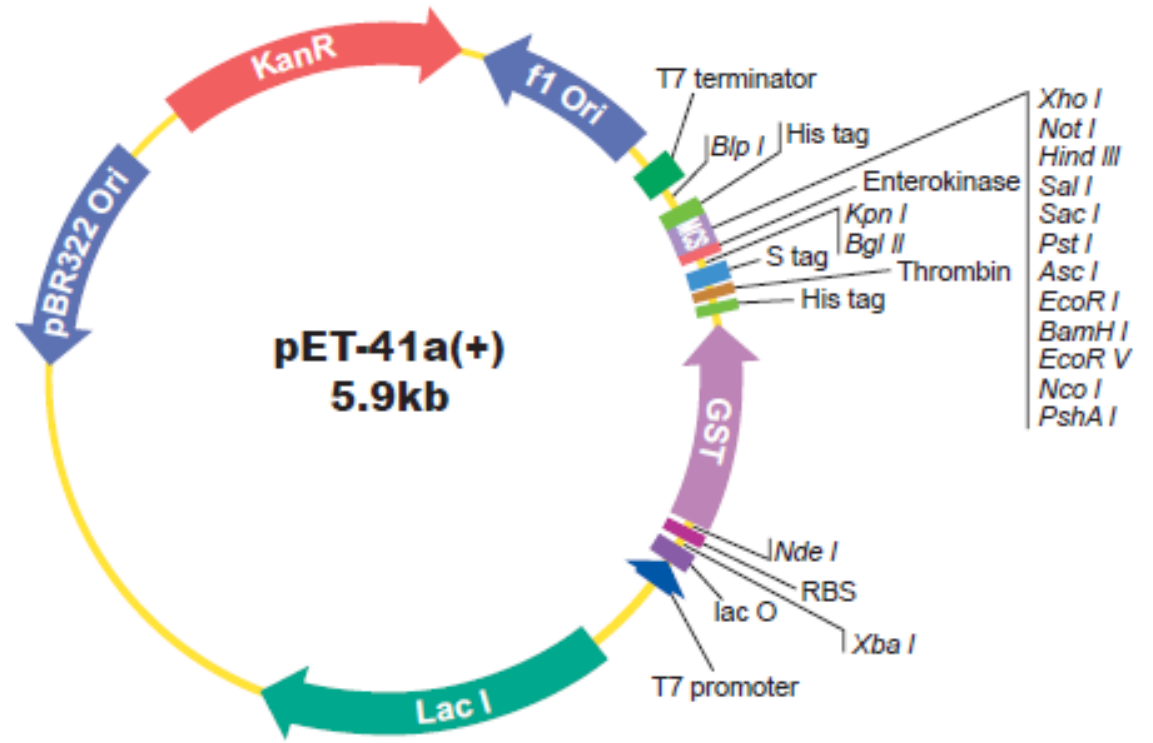
pET-32a(+)



pET-32b(+)



pET-41a(+)



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T7 promoter      lac operator      Xba I      rbs      Nde I      GST tag
-- T AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT ATA CAT ATG TCC CCT ATA CTA GGT
M S P I L G

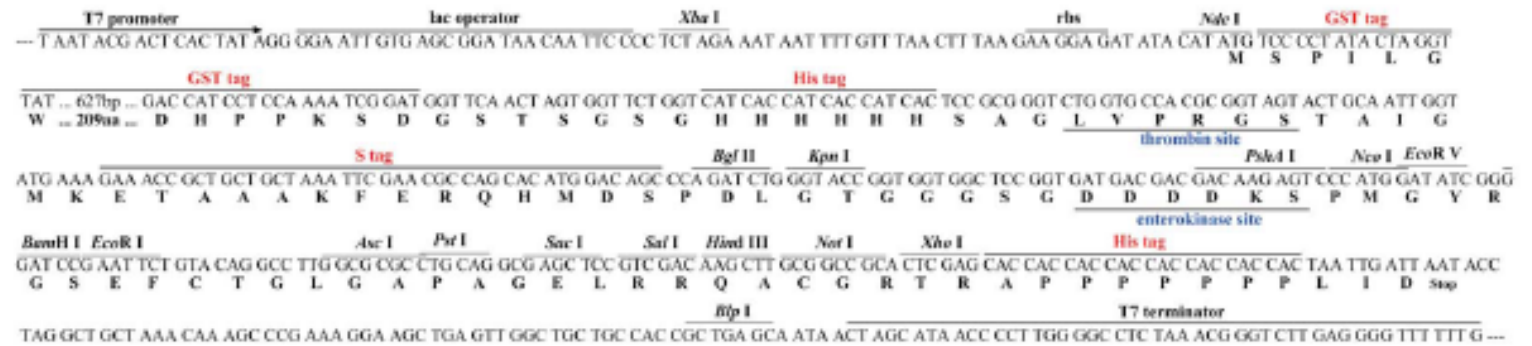
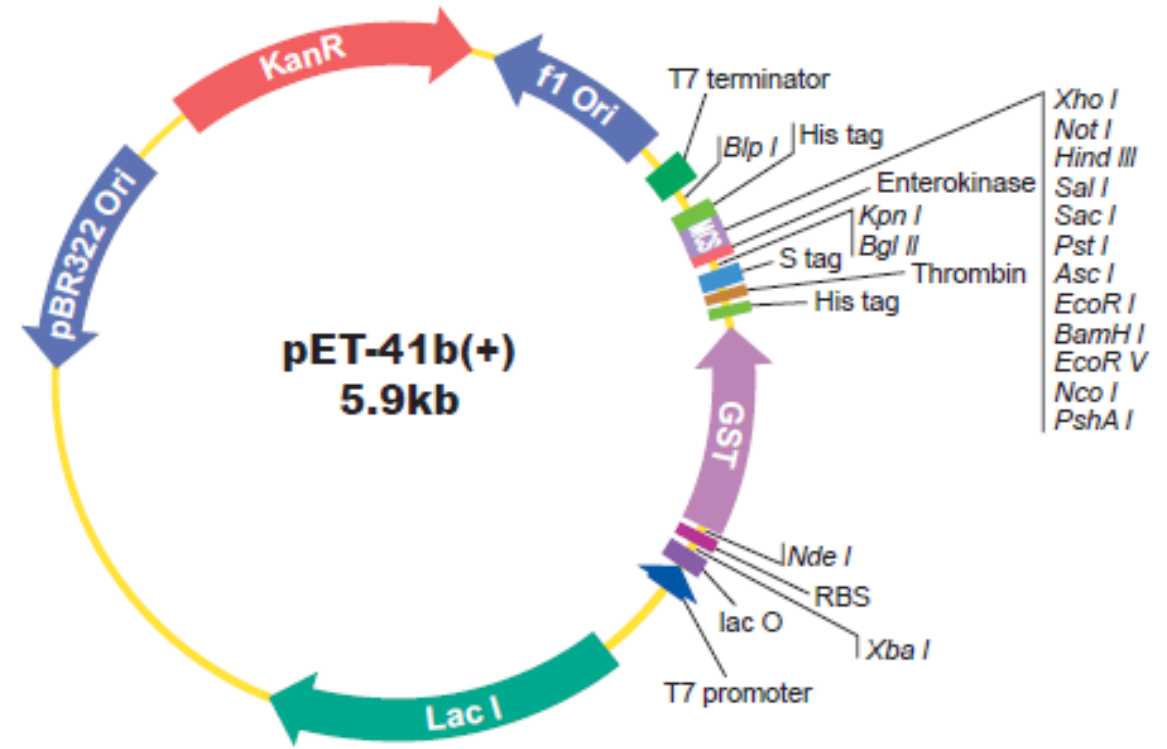
GST tag      His tag
TAT ... 62Tbp ... GAC CAT CCT CCA AAA TCG GAT GGT TCA ACT AGT GGT TCT GGT CAT CAC CAT CAC CAT CAC TCC CGC GGT CTG GTG CCA CGC GGT AGT ACT GCA ATT GGT
W ... 205aa ... D H P P K S D G S T S G S G H H H H H H S A G L V P R G S T A I G

S tag      Bgl II      Kpn I      thrombin site      Pst I      Nco I      EcoR V
ATG AAA GAA ACC GCT GCT GCT AAA TTC GAA CGC CAG CAC ATG GAC AGC CCA GAT CTG GGT ACC GGT GGT GGC TCC GGT GAT GAC GAC GAC AAG AGT CCC ATG GGA TAT CCG
M K E T A A A K F E R Q H M D S P D L G T G G G S G D D D D K S P M G V R

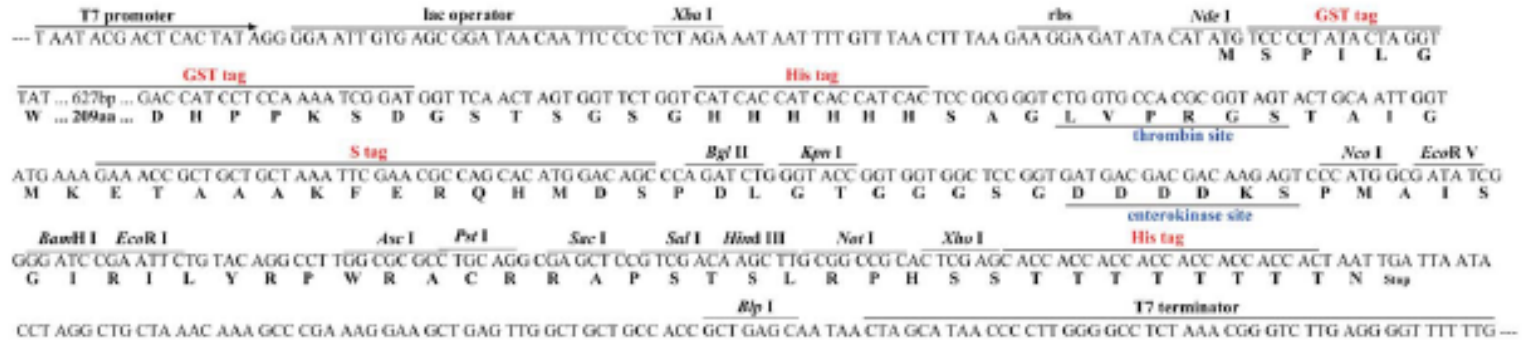
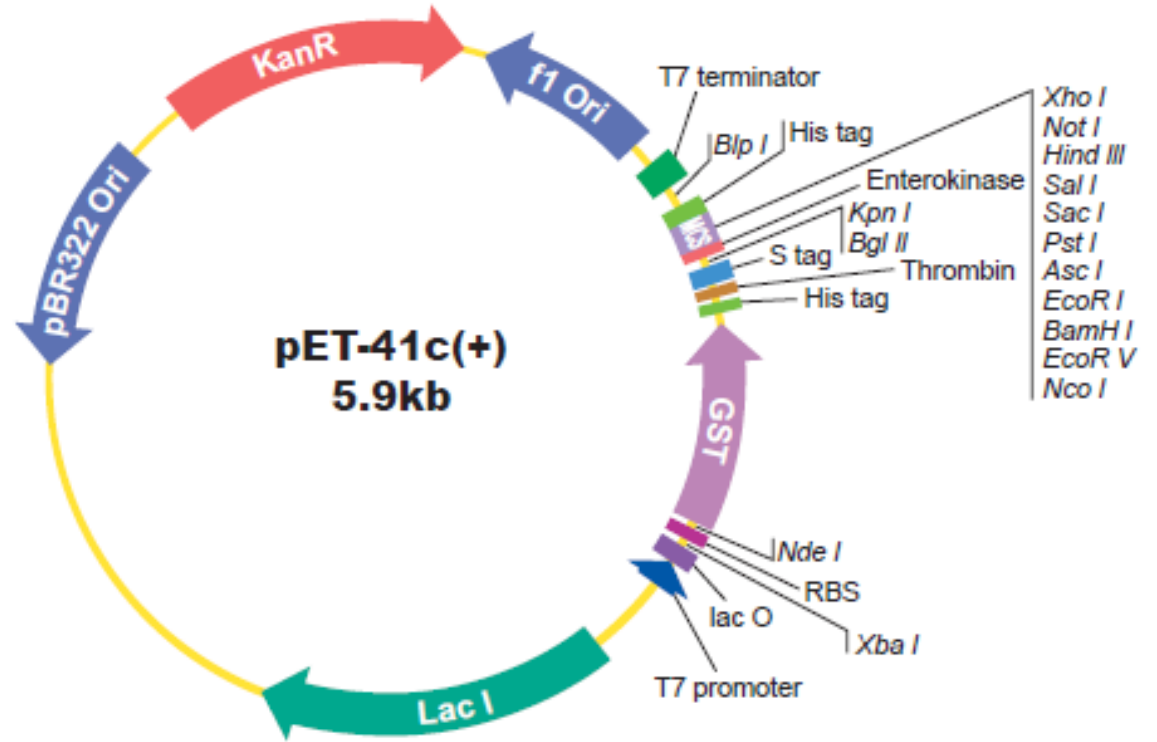
BamH I      EcoR I      Asc I      Pst I      Sac I      Sal I      Hind III      Not I      Xho I      His tag
GGA TCC GAA TTC TGT ACA GGC CTT GGC GCG CCT GCA GGC GAG CTC CGT CGA CAA GCT TGC GGC CGE ACT CGA GCA CCA CCA CCA CCA CCA CCA CCA CTA ATT GAT TAA TAC
G S E F C T G L G A P A G E L R R Q A C G R T R A P P P P P P P L I D Stop

Bsp I      T7 terminator
CTA GGC TGC TAA ACA AAG CCC GAA AGG AAG CTG AGT TGG CTG CTG CCA CGC CTG AGC AAT AAC TAG CAT AAC CCC TTG GGG OCT CTA AAC GGG TCT TGA GGG GTT TTT TG--
    
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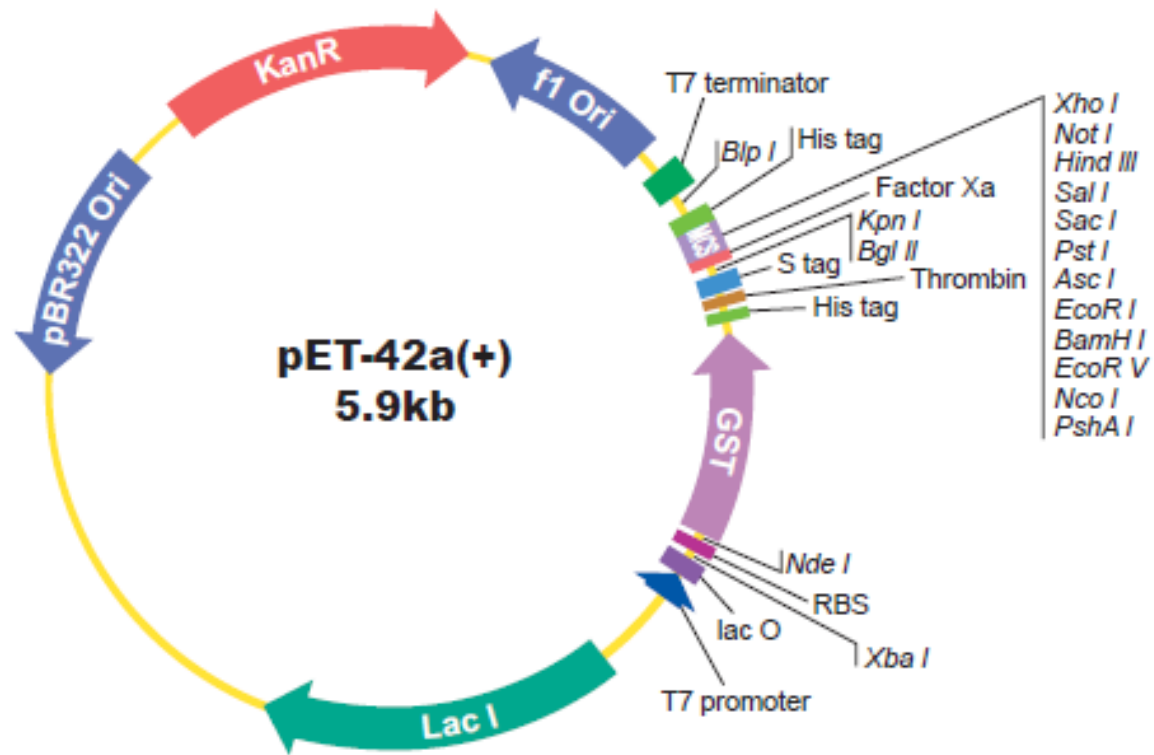
pET-41b(+)



pET-41c(+)



pET-42a(+)



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T7 promoter          lac operator          Xba I          rbs          Nde I          GST tag
-- T AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT ATA CAT ATG TCC CCT ATA CTA GGT
M S P I L G

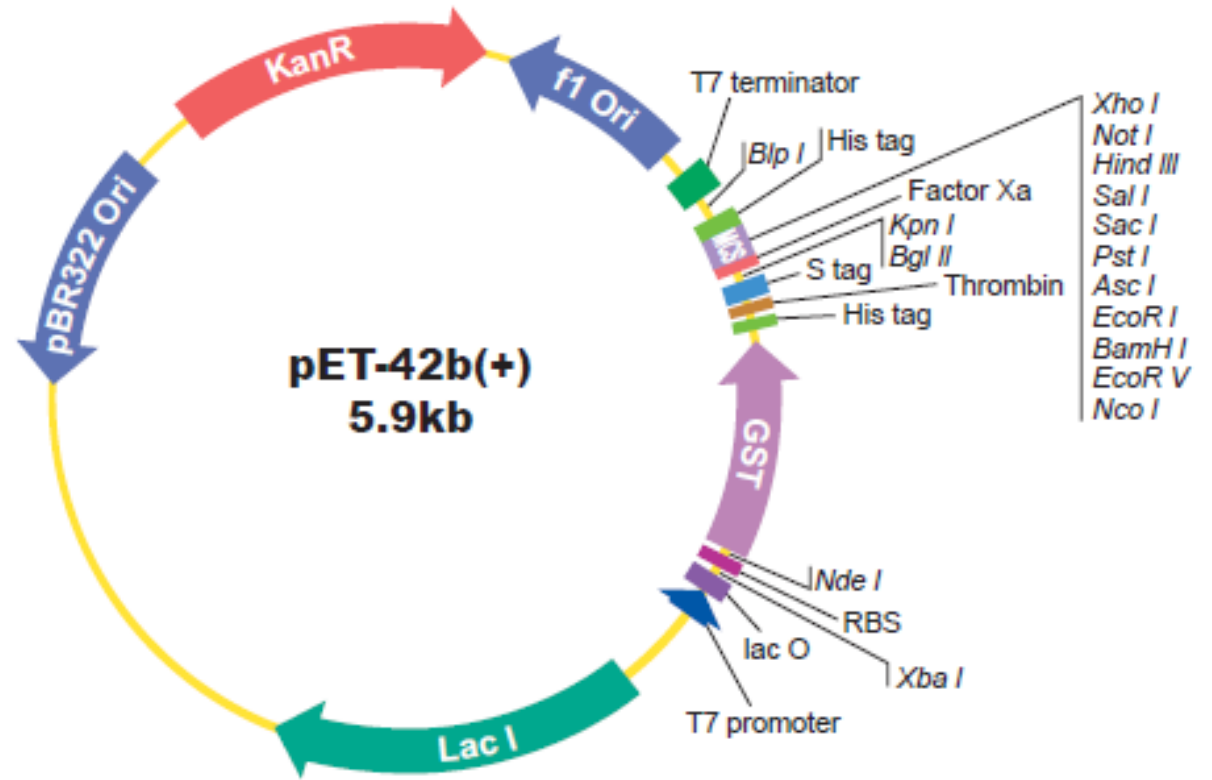
GST tag          His tag
TAT ... 627bp ... GAC CAT CCT CCA AAA TCG GAT GGT TCA ACT AGT GGT TCT GGT CAT CAC CAT CAC CAT CAC TCC GCG GGT CTG GTG CCA CGC GGT AGT ACT GCA ATT GGT
W ... 209aa ... D H P P K S D G S T S G S G H H H H H H S A G L Y P R G S T A I G

S tag          Bgl II          Kpn I          thrombin site          Pst I          Nco I          EcoR V
ATG AAA GAA ACC GCT GCT GCT AAA TTC GAA CGC CAG CAC ATG GAC AGC CCA GAT CTG GGT ACC GGT GGT GGC TCC GGT ATT GAG GGA CGC GGG TCC ATG GGA TAT CCG
M K E T A A A K F E R Q H M D S P D L G T G G G S G I E G R C S M G V R

BamH I          EcoR I          Asc I          Pst I          Sac I          Sal I          Hind III          Nar I          Xho I          Factor Xa
GGA TCC GAA TTC TGT ACA GGC CTT GGC GCG CCT GCA GGC GAG CTC CGT CGA CAA GCT TGC GGC CGC ACT CGA GCA CCA CCA CCA CCA CCA CCA CTA ATT GAT TAA TAC
G S E F C T G L G A P A G E L R R Q A C G R T R A P P P P P P P L I D Stop

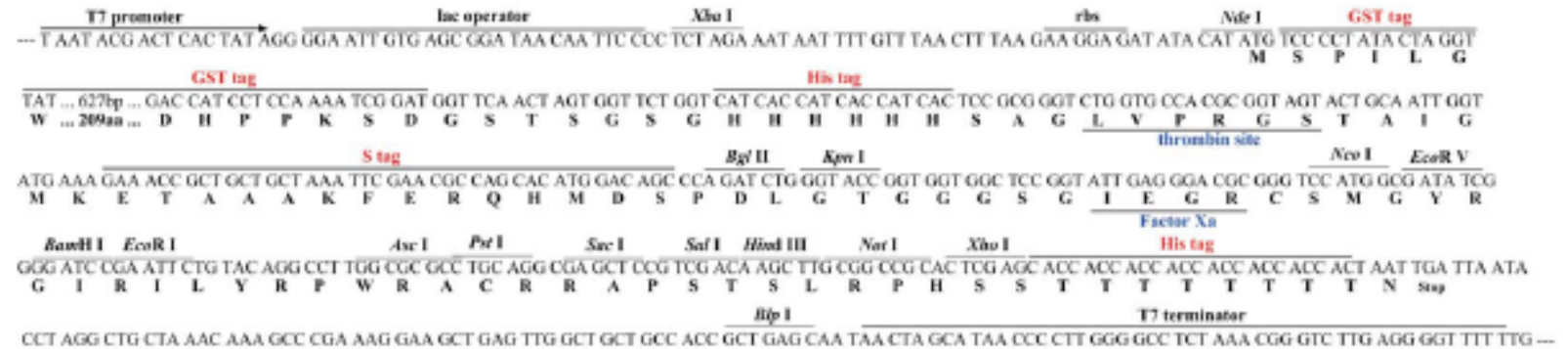
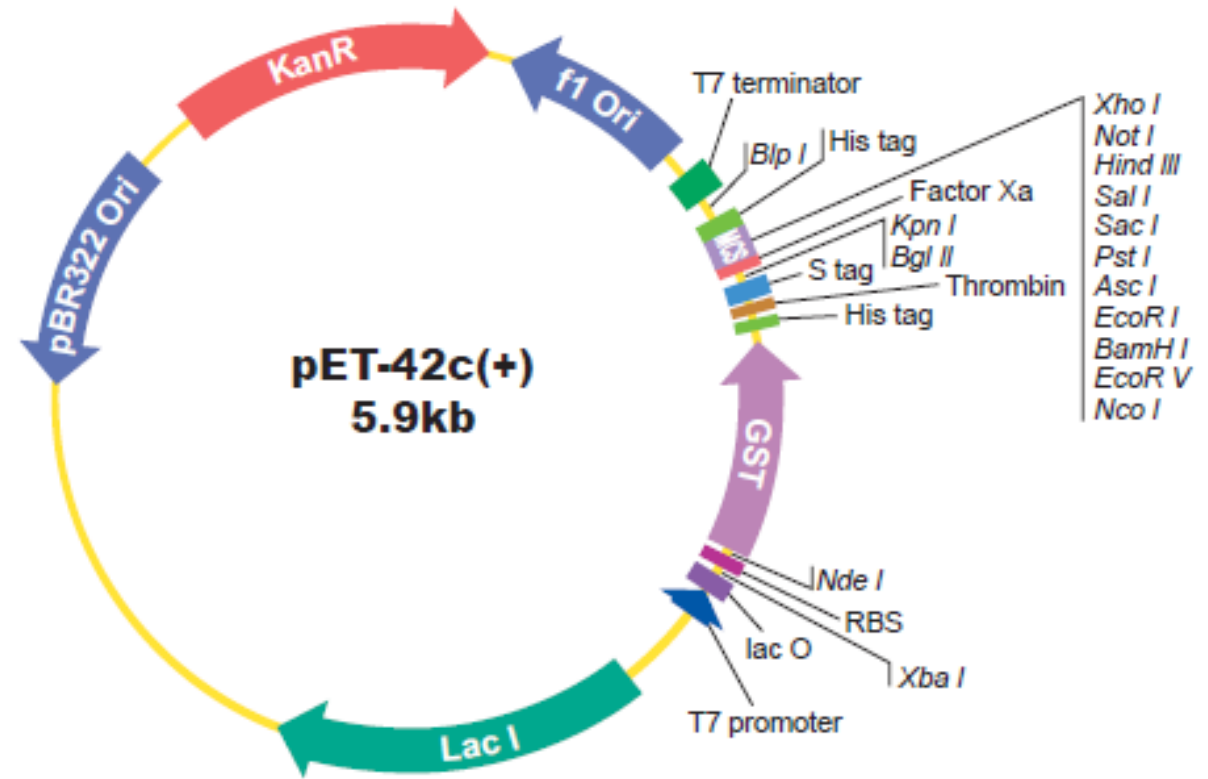
Avr II          Bsp I          T7 terminator
CTA GGC TGC TAA ACA AAG CCC GAA AGG AAG CTG AGT TGG CTG CTG CCA CCG CTG AGC AAT AAC TAG CAT AAC CCC TTG GGG OCT CTA AAC GGG TCT TGA GGG GTT TTT TG --
    
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pET-42b(+)

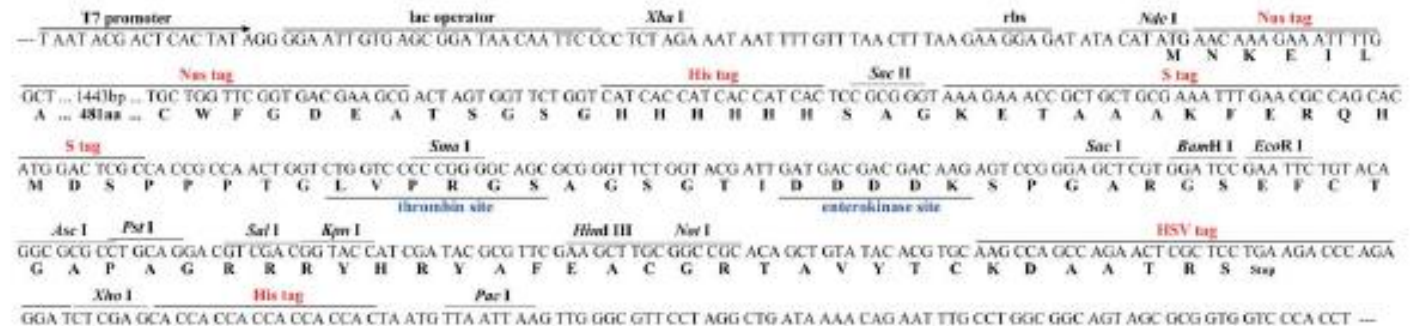
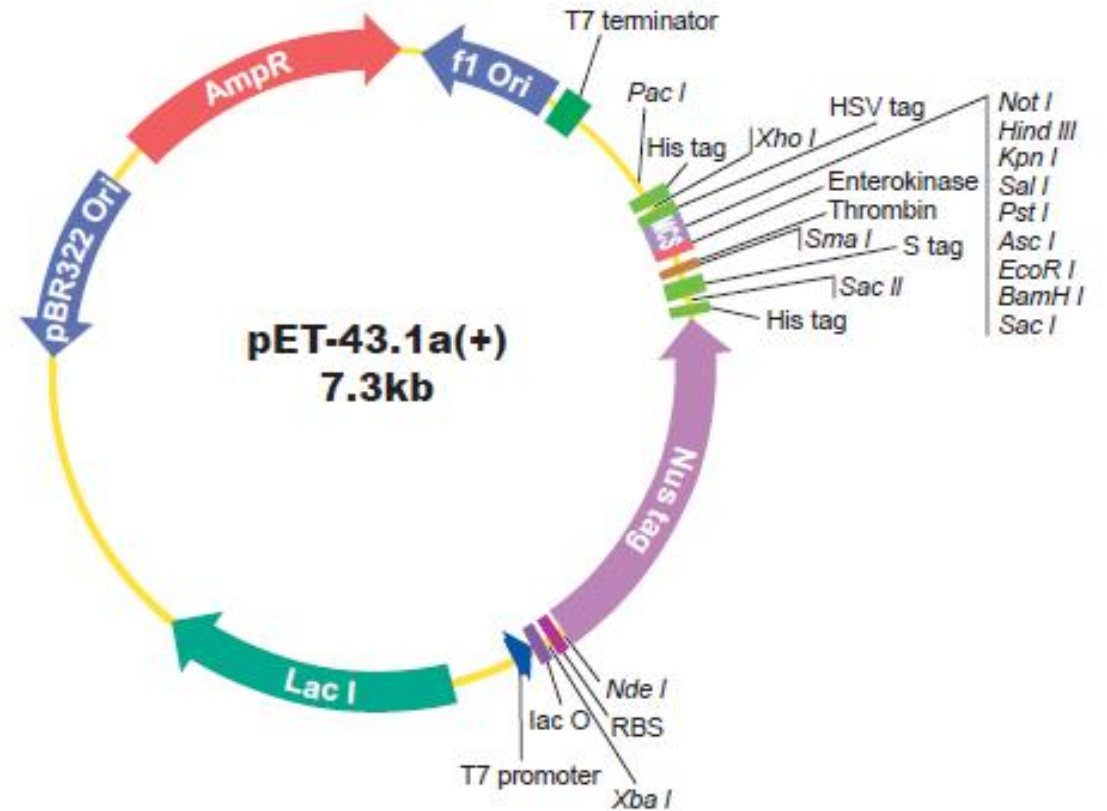


T7 promoter → **lac operator** **Xba I** **rbs** **Nde I** **GST tag**
 --- T AAT ACG ACT CAC TAT AGG OGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT TTT GTT TAA CTT TAA GAA GGA GAT ATA CAT ATG TCC CCT ATA CTA GGT
 M S P I L G
GST tag **His tag**
 TAT .. 627bp ... GAC CAT CCT OCA AAA TCG GAT GGT TCA ACT AGT GGT TCT GGT CAT CAC CAT CAC CAT CAC TCC GCG GGT CTG GTG CCA CGC GGT AGT ACT GCA ATT GGT
 W .. 209aa ... D H P P K S D G S T S G S G H H H H H H S A G L Y P R G S T A I G
S tag **Bgl II** **Kpn I** **thrombin site** **Nco I** **EcoRV**
 ATG AAA GAA ACC GCT GCT GCT AAA TTC GAA CGC CAG CAC ATG GAC AGC CCA GAT CTG GGT ACC GGT GGT GGC TCC GGT ATT GAG GGA CGC GGG TCC ATG GAT ATC GGG
 M K E T A A A K F E R Q H M D S P D L G T G G G S G I E G R C S M G Y R
BamHI **EcoRI** **Asc I** **Pst I** **Sac I** **Sal I** **Hind III** **Nor I** **Xho I** **His tag**
 GAT CCG AAT TCT GTA CAG GCC TTG GCG CGC CTG CAG GCG AGC TCC GTC GAC AAG CTT GCG GCC GCA CTC GAG CAC CAC CAC CAC CAC CAC CAC CAC TAA TTG ATT AAT ACC
 G S E F C T G L G A P A G E L R R Q A C G R T R A P P P P P P L I D Stop
Bsp I **T7 terminator**
 TAG GCT GCT AAA CAA AGC CCG AAA GGA AGC TGA GTT GGC TGC TGC CAC CGC TGA GCA ATA ACT AGC ATA ACC CCT TGG GGC CTC TAA ACG GGT CTT GAG GGG TTT TTT G ---

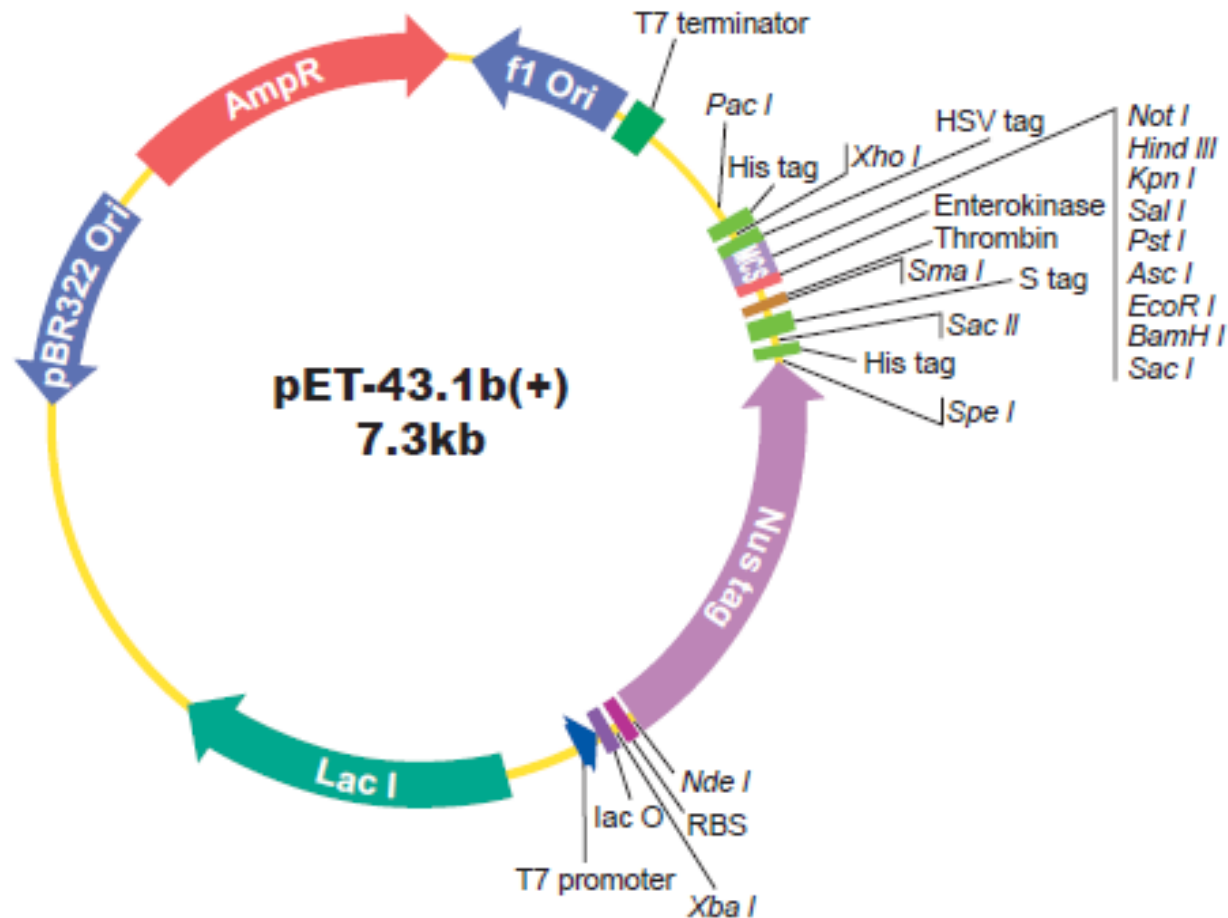
pET-42c(+)



pET-43.1a(+)



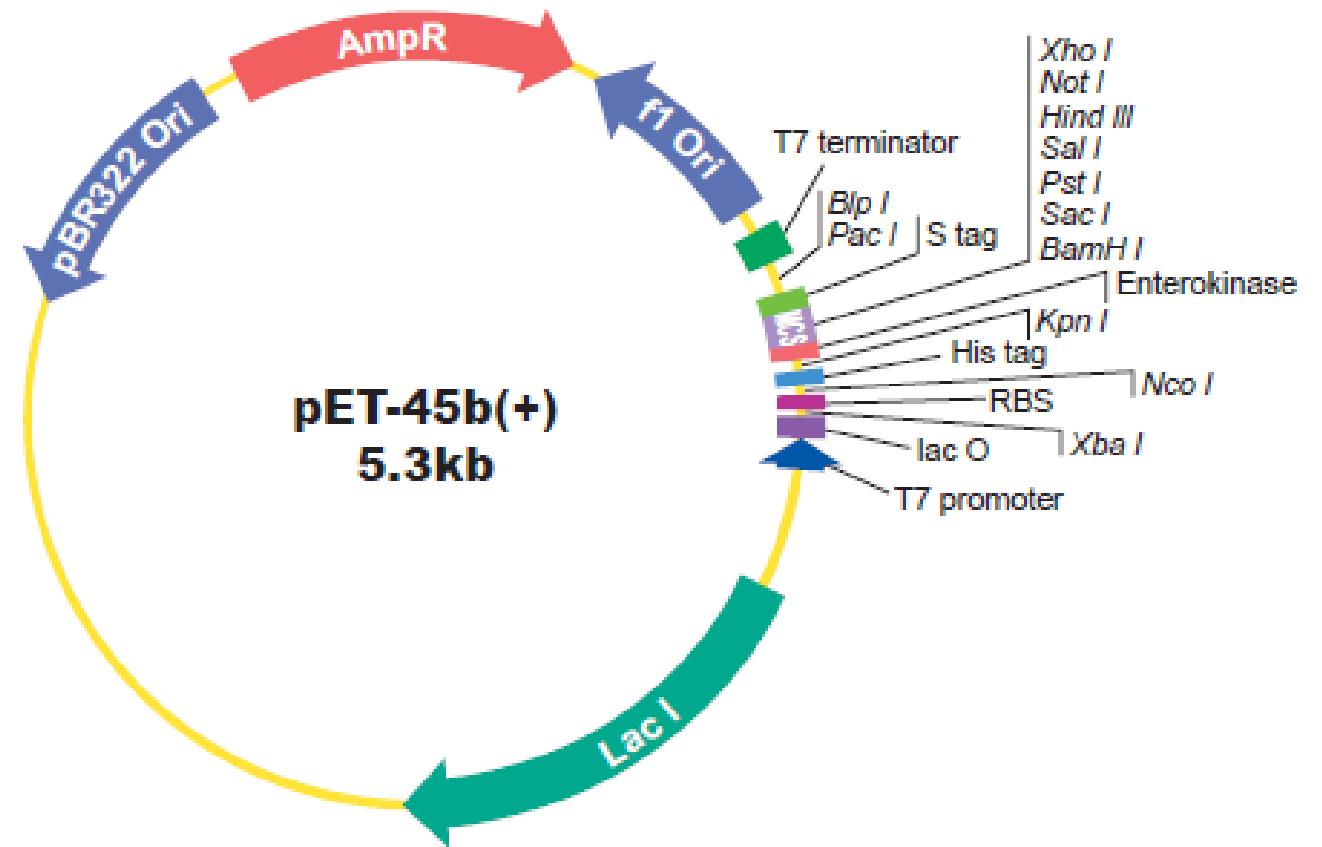
pET-43.1b(+)



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T7 promoter      lac operator      Xba I      rbs      Nde I      Nus tag
---T AAT ACG ACT CAC TAT AGG GGA ATT GTG AGC GGA TAA CAA TTC CCC TCT AGA AAT AAT TTT GTT TAA CTT TAA GAA GGA GAT ATA CAT ATG AAC AAA GAA ATT TTG
                                                                    M N K E I L
Nus tag      Spe I      His tag      Sac II      S tag
GCT ... 1443bp ... TGC TGG TTC GGT GAC GAA GCG ACT AGT GGT TCT GGT CAT CAC CAT CAC CAT CAC TCC GCG GGT AAA GAA ACC GCT GCT CCG AAA TTT GAA CGC CAG CAC
A ... 481aa ... C W F G D E A T S G S G H H H H H S A G K E T A A A K F E R Q H
S tag      Sma I      Sma I      Sac I      BamH I      EcoR I
ATG GAC TCG CCA CCG CCA ACT GGT CTG GTC CCC CGG GGC AGC GCG GGT TCT GGT ACG ATT GAT GAC GAC GAC AAG AGT CCG GAG CTC GTG GAT CCG AAT TCT GTA CAG
M D S P P P T G L V P R G S A G S G T I D D D K S P E L V D P N S V Q
                                                                    thrombin site      enterokinase site
Asc I      Pst I      Sal I      Kpn I      Hind III      Not I      HSV tag
GCG CGC CTG CAG GAC GTC GAC GGT ACC ATC GAT ACG CGT TCG AAG CTT GCG GCC GCA CAG CTG TAT ACA DGT GCA AGC CAG CCA GAA CTC GCT CCT GAA GAC CCA GAG
A R L Q D V D G T I D T R S K L A A A Q L Y T R A S Q P E I A P E D P E
Xba I      His tag      Pac I
GAT CTC GAG CAC CAC CAC CAC CAC TAA TGT TAA TTA AGT TGG GCG TTC CTA GGC TGA TAA AAC AGA ATT TGC CTG GCG GCA GTA GCG CGG TGG TCC CAC CT ---
D L E H H H H H H Stop
    
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pET-45b(+)

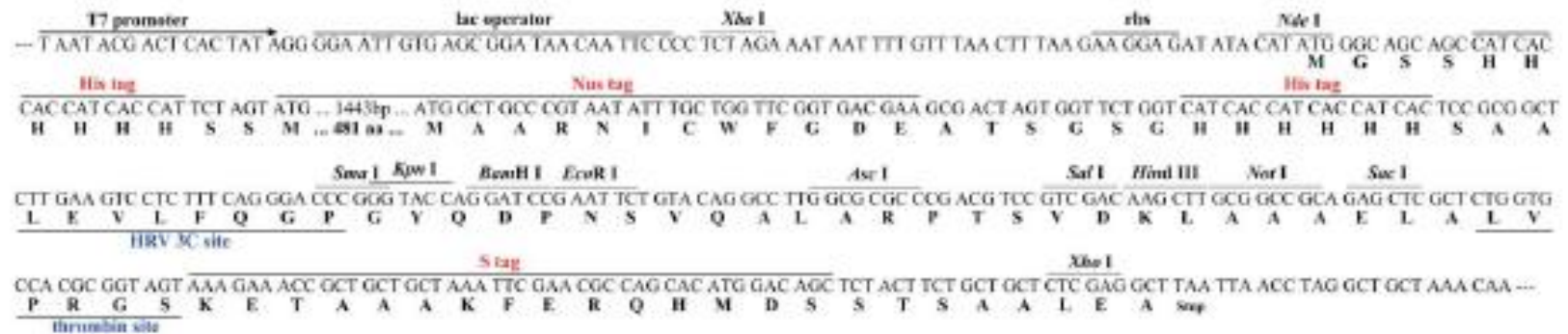
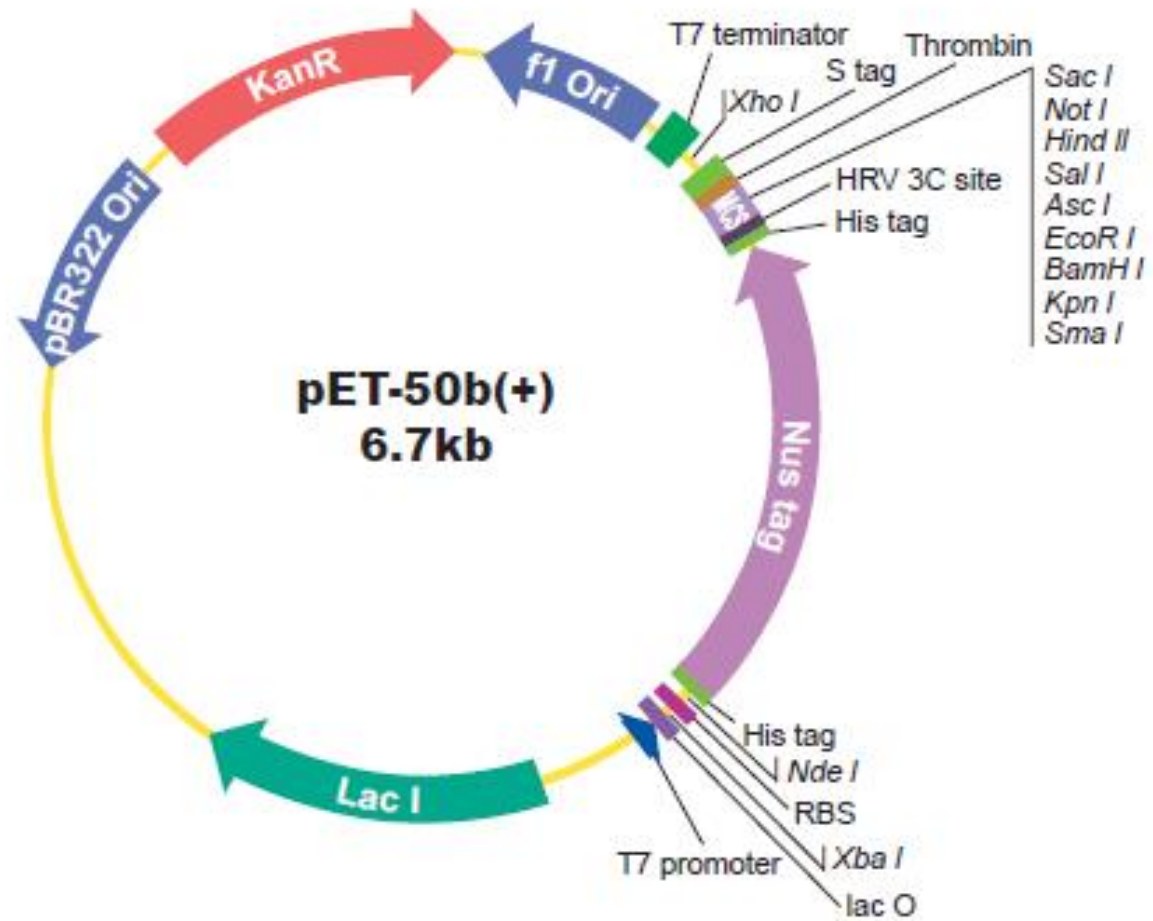


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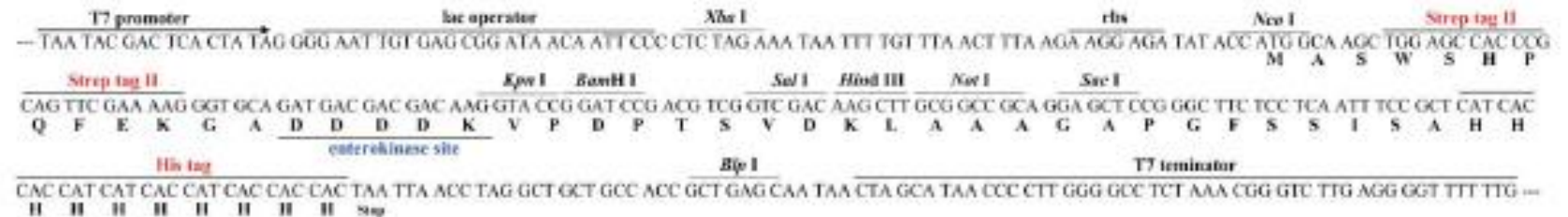
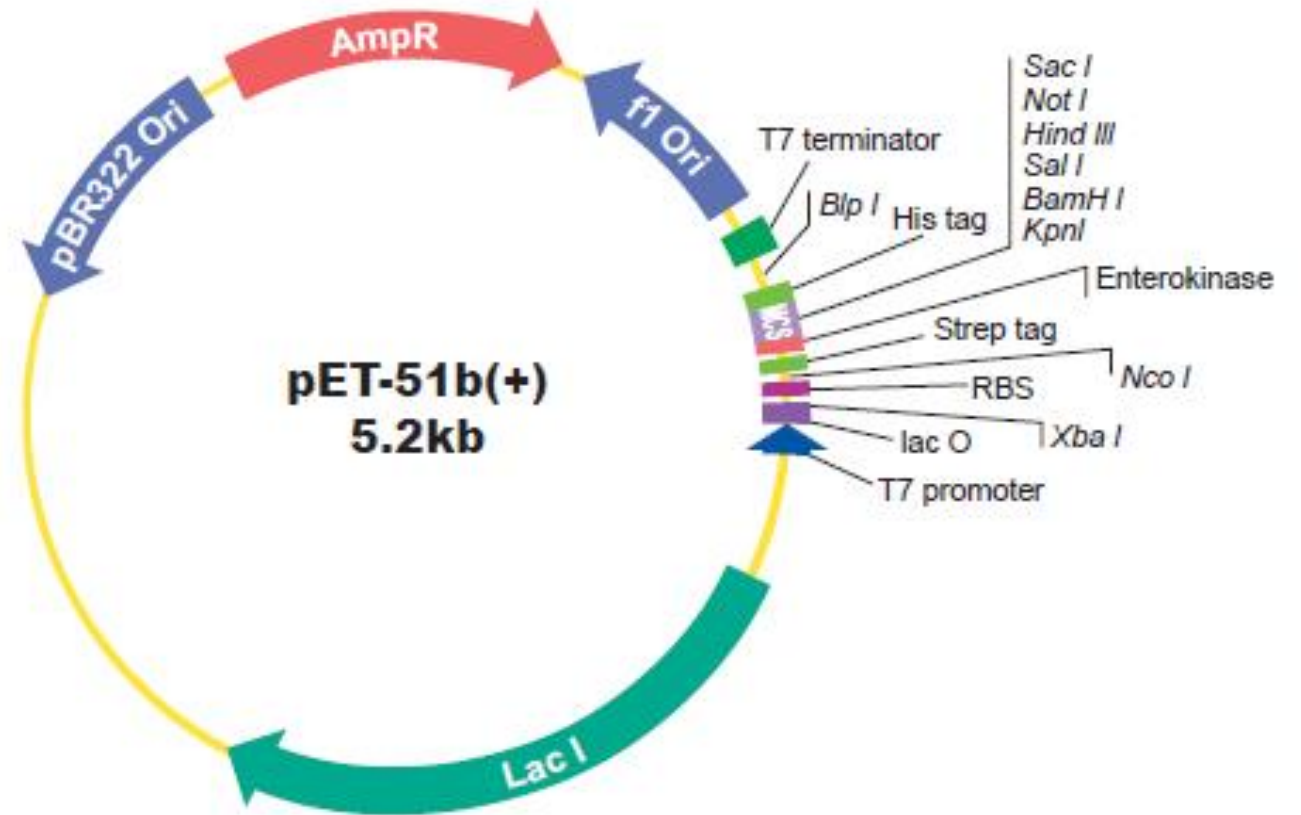
T7 promoter      lac operator      Nde I      rbs      Nco I      His tag
-- TAA TAC GAC TCA CTA TAG GGG AAT TGT GAG CGG ATA ACA ATT CCC CTC TAG AAA TAA TTT TGT TTA ACT TTA AGA AGG AGA TAT ACC ATG GCA CAT CAC CAC CAC
M A H H H H
Kpn I      BamH I      Sac I      Pst I      Sal I      Hind III      Not I      Xba I
CAT CAC GTG GGT ACC GGT TCG AAT GAT GAC GAC GAC AAG AGT CCG GAT CCC AAT TGG GAG CTC GTG TAC ACG GCG CCG CTG CAG GTC GAC AAG CTT GCG GCC GCA CTC
H H V G T G S N D D D K S P D P N W E L V Y T A R L Q V D K L A A A L
enterokinase site      S tag      Pac I      Bsp I
GAG TCT GGT AAA GAA ACC GCT GCT GCG AAA TTT GAA CCG CAG CAC ATG GAC TCG TCT ACT AGC GCA GCT TAA TTA ACC TAG GCT GCT GCC ACC GCT GAG CAA TAA CTA
E S G K E T A A A K F E R Q H M D S S T S A A stop
T7 terminator
GCA TAA CCC CTT GGG GCC TCT AAA CGG GTC TTG AGG GGT TTT TTG --

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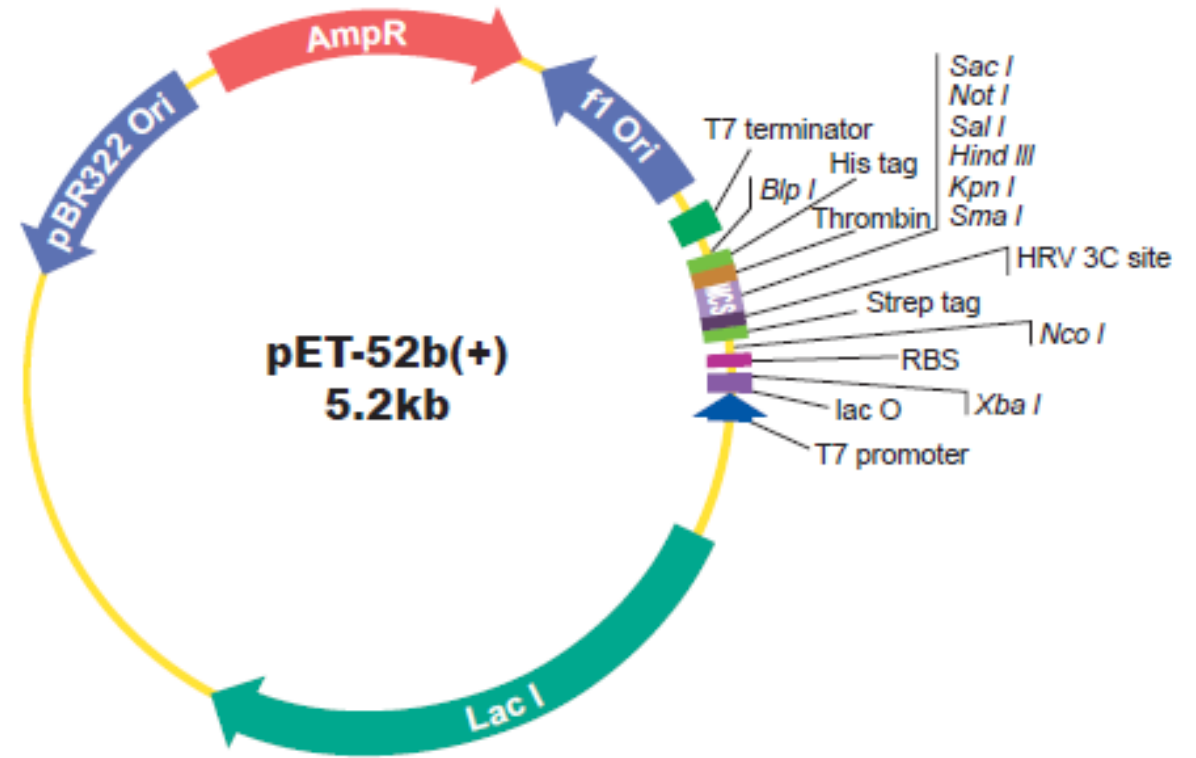
pET-50b(+)



pET-51b(+)

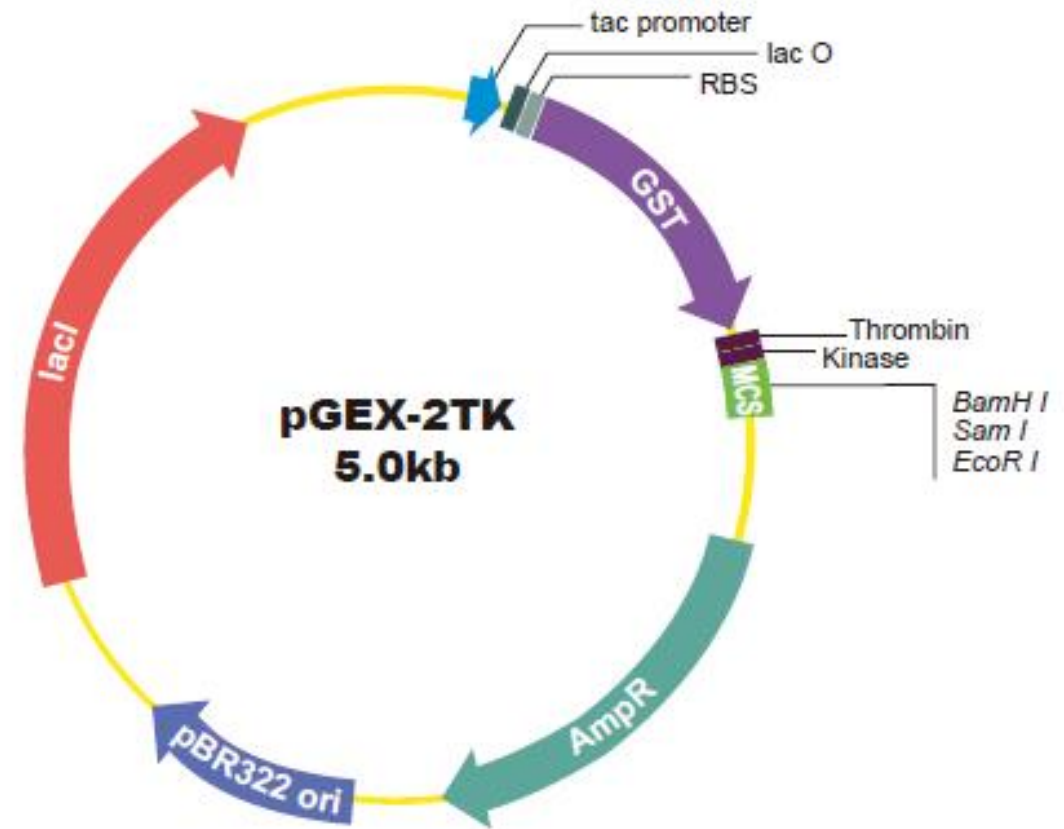


pET-52b(+)



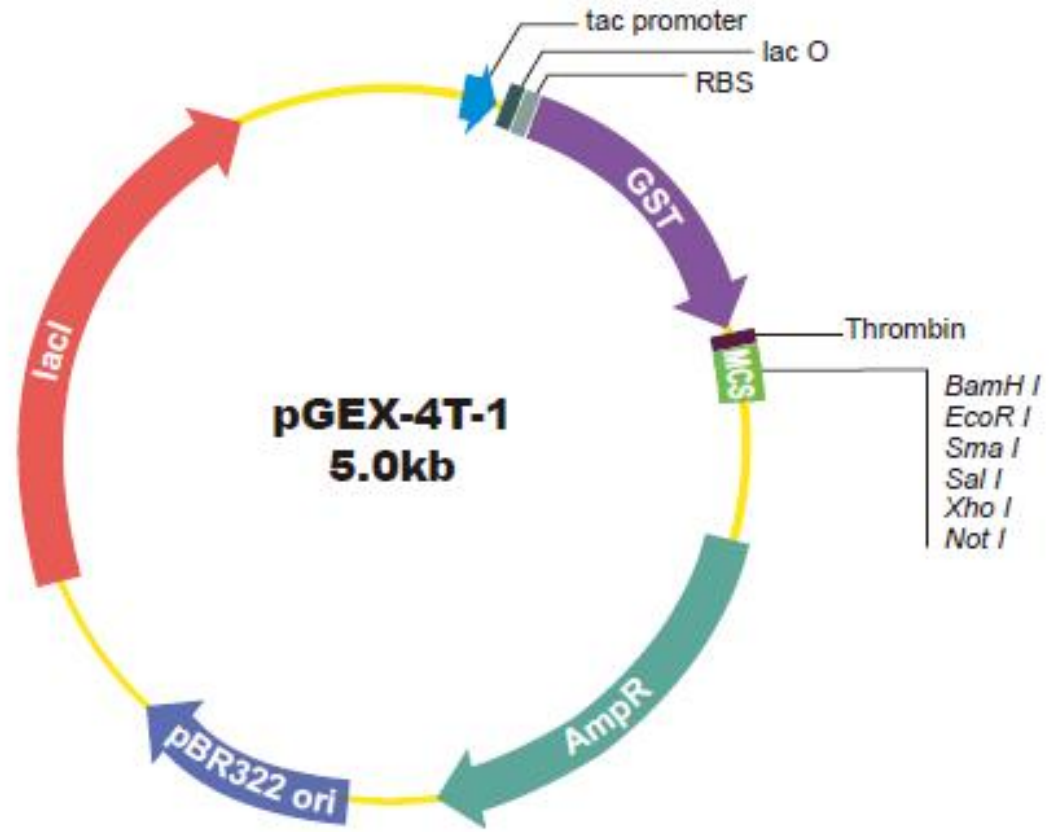
T7 promoter → lac operator Xba I rbs Nco I Strep tag II
 -- TAA TAC GAC TCA CTA TAG GGG AAT TGT GAG CCG ATA ACA ATT CCC CTC TAG AAA TAA TTT TGT TTA ACT TTA AGA AGG AGA TAT ACC ATG GCA AGC TGG AGC CAC
 Strep tag II Sma I Kpn I BamHI Sal I Not I Sac I M A S W S H
 CCG CAG TTC GAA AAG GGT GCA CTT GAA GTC CTC TTT CAG GGA CCC GGG TAC CAG GAT CCT GTA CAA GTC GAC GCG GCC GCA GAG CTC GCT CTG GTG CCA CGC GGT
 P Q F E K G A L E V L F Q G P G Y Q D P V Q V D A A A E L A L V P R G
 His tag HRV 3C site Blp I thrombin site
 AGT TCC GCT CAT CAC CAC CAT CAT CAC CAT CAC CAC CAC TAA TTA ACC TAG GCT GCT GCC ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GGG GCC TCT AAA CGG GTC
 S S A H H H H H H H H H H S
 T7 terminator
 TTG AGG GGT TTT TTG --

pGEX-2TK



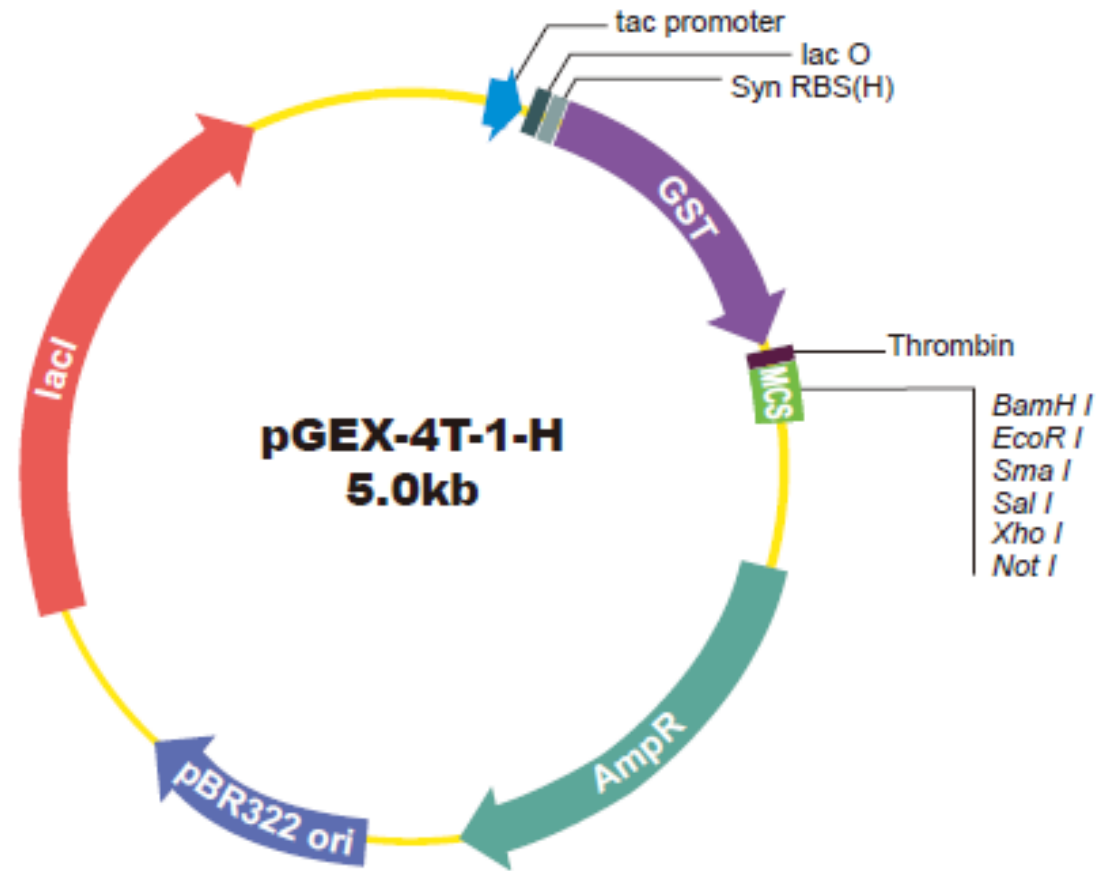
tac promoter → lac operator rbs GST tag
 --- TTG ACA ATT AAT CAT CCG CTC GTA TAA TGT GTG GAA TTG TGA GCG GAT AAC AAT TTC ACA CAG GAA ACA GTA TTC ATG TCC CCT ATA ... 621bp ... GGT
 M S P I ... 207aa ... G
 GST tag BamHI SmaI EcoRI
 GGC GAC CAT CCT CCA AAA TCG GAT CTG GTT CCG CGT GGA TCT CGT CGT GCA TCT GTT GGA TCC CCG GGA ATT CAT CGT GAC TGA CTG ACG ATC ---
 G D H P P K S D L V P R G S R R A S V G S P G I H R D stop
 thrombin site kinase site

pGEX-4T-1



tac promoter → lac operator rbs GST tag
 --- TTG ACA ATT AAT CAT CCG CTC GTA TAA TGT GTG GAA TTG TGA GCG GAT AAC AAT TTC ACA CAG GAA ACA GTA TTC ATG TCC CCT ATA ... 621bp ... GGT
 M S P I ... 207aa ... G
 GST tag BamHI EcoRI SmaI SalI XhoI NotI
 GGC GAC CAT CCT CCA AAA TCG GAT CTG GTT CCG CGT GGA TCC CCG GAA TTC CCG GGT CGA CTC GAG CCG CCG CAT CGT GAC TGA CTG ACG ---
 G D H P P K S D L V P R G S P E F P G R L E R P H R D Stop
 thrombin site

pGEX-4T-1-H

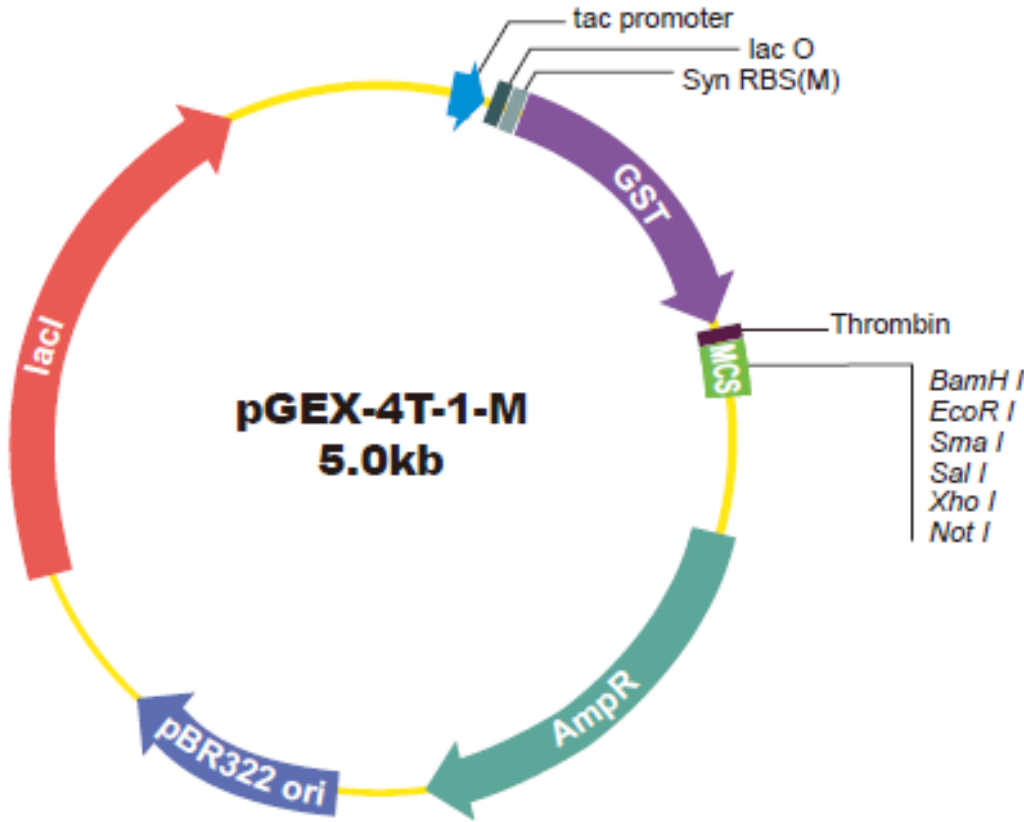


^{tac promoter}
 -- T TGA CAA TTA ATC ATC GGC TCG TAT AAT GTG TGG AAT TGT GAG CCG ATA ACA ATT CCG CAA AAT TAT ACA ACT AGG AGG TAT TTC ATG TCC CCT
^{lac operator}

^{synthetic rbs}
 M S P
^{GST tag}

^{GST tag}
 ATA ... 621bp ... GGT GGC GAC CAT CCT CCA AAA TCG GAT CTG GTT CCG CGT GGA TCC CCG GAA TTC CCG GGT CGA CTC GAG CCG CCG CAT CGT GAC TGA CTG ACG ...
 I ... 207aa ... G G D H P P K S D L V P R G S P E F P G R L E R P H R D stop
^{thrombin site}

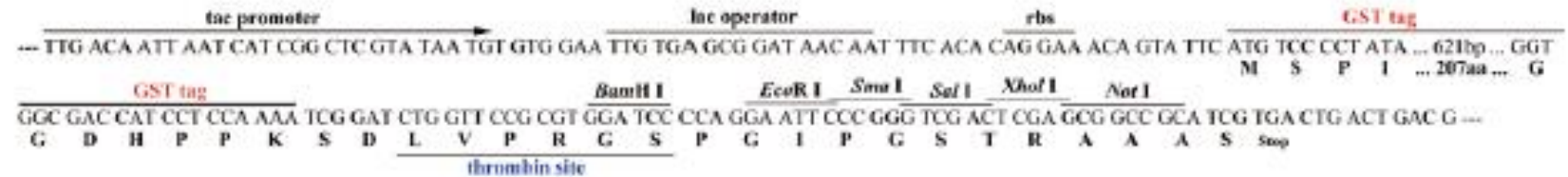
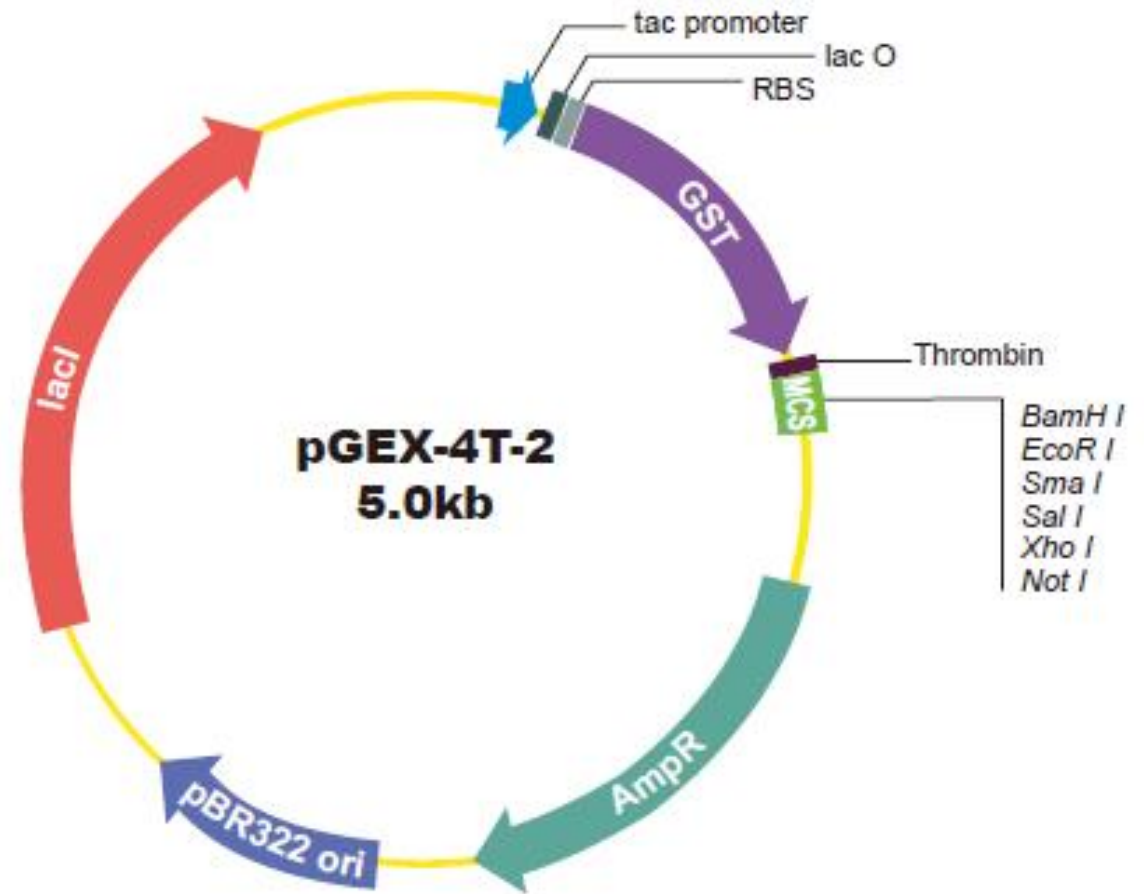
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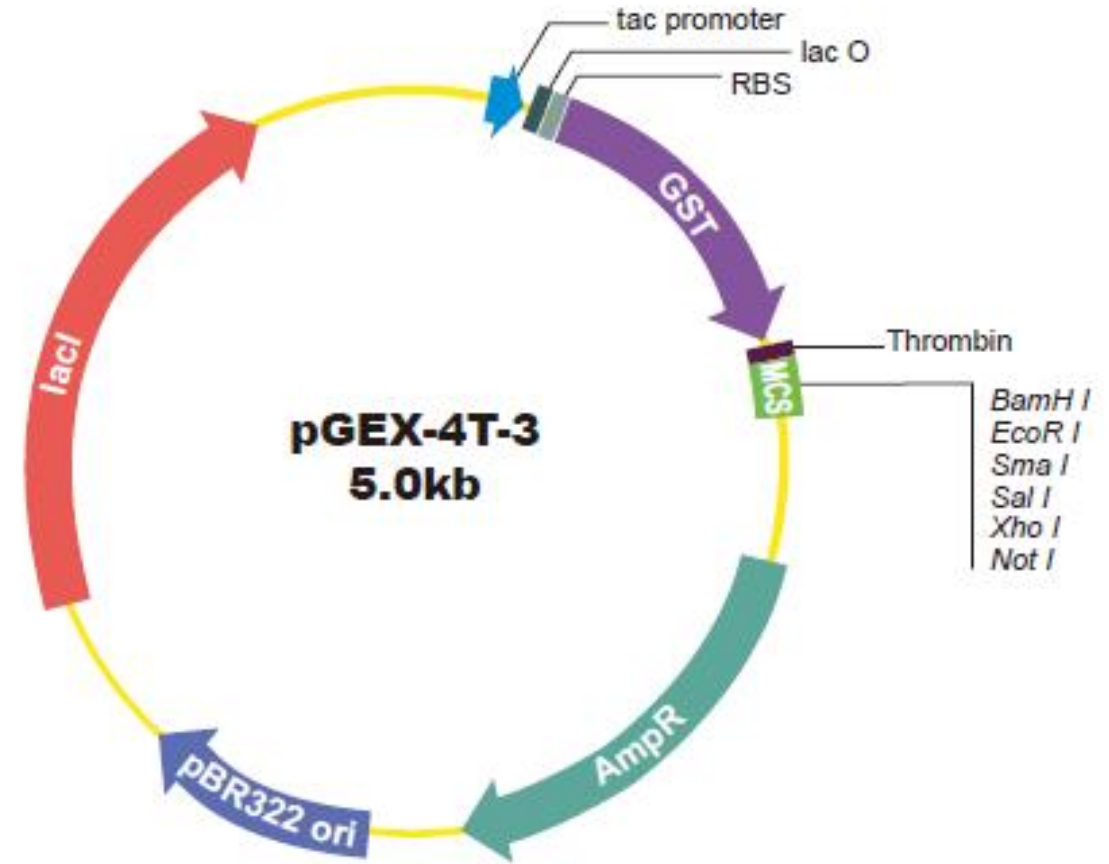
Sequence alignment showing the tac promoter, lac operator, synthetic rbs, and GST tag regions:

```
--- T TGA CAA TTA ATC ATC GGC TCG TAT AAT GTG TGG AAT TGT GAG CCG ATA ACA ATT GGT ACA AAC CGA CGA GGA AGA GGT CCG TTC ATG TCC CCT
                                     lac operator                                     synthetic rbs                                     GST tag
                                     lacO                                         synthetic rbs                                       ATG TCC CCT
                                     GST tag                                             M S P
ATA ... 621bp ... GGT GGC GAC CAT CCT CCA AAA TCG GAT CTG GTT CCG CGT GGA TCC CCG GAA TTC CCG GGT CGA CTC GAG CCG CCG CAT CGT GAC TGA CTG ACG ---
I ... 207aa ... G G D H F P K S D L V P R G S P E F P G R L E R P H R D stop
                                     thrombin site
```


pGEX-4T-2

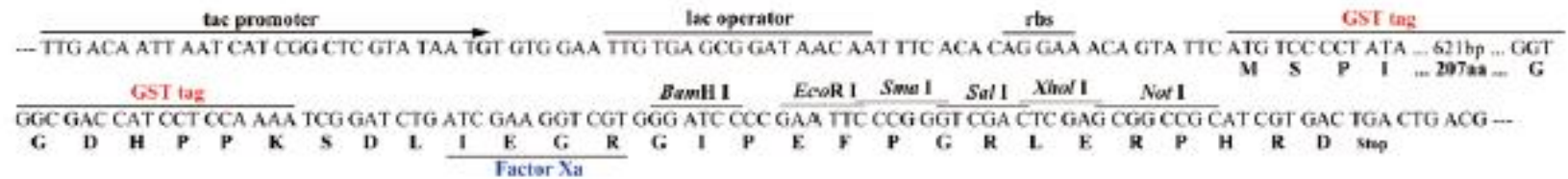
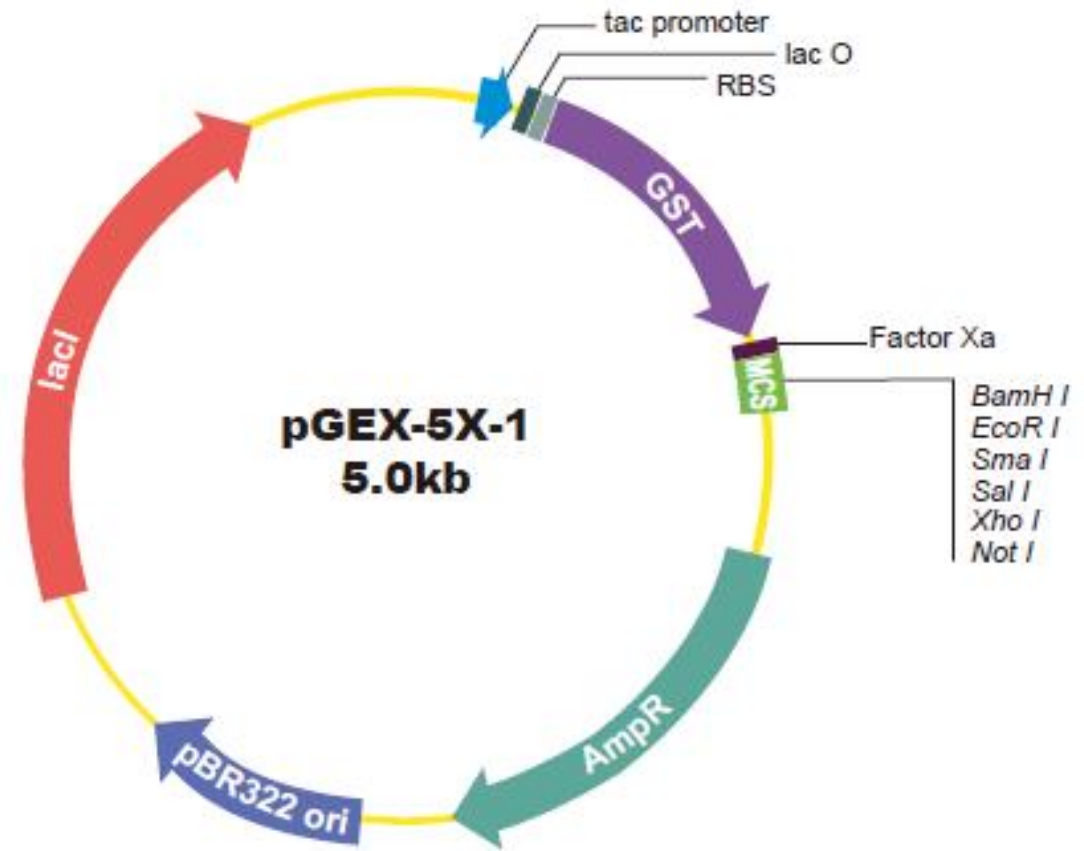


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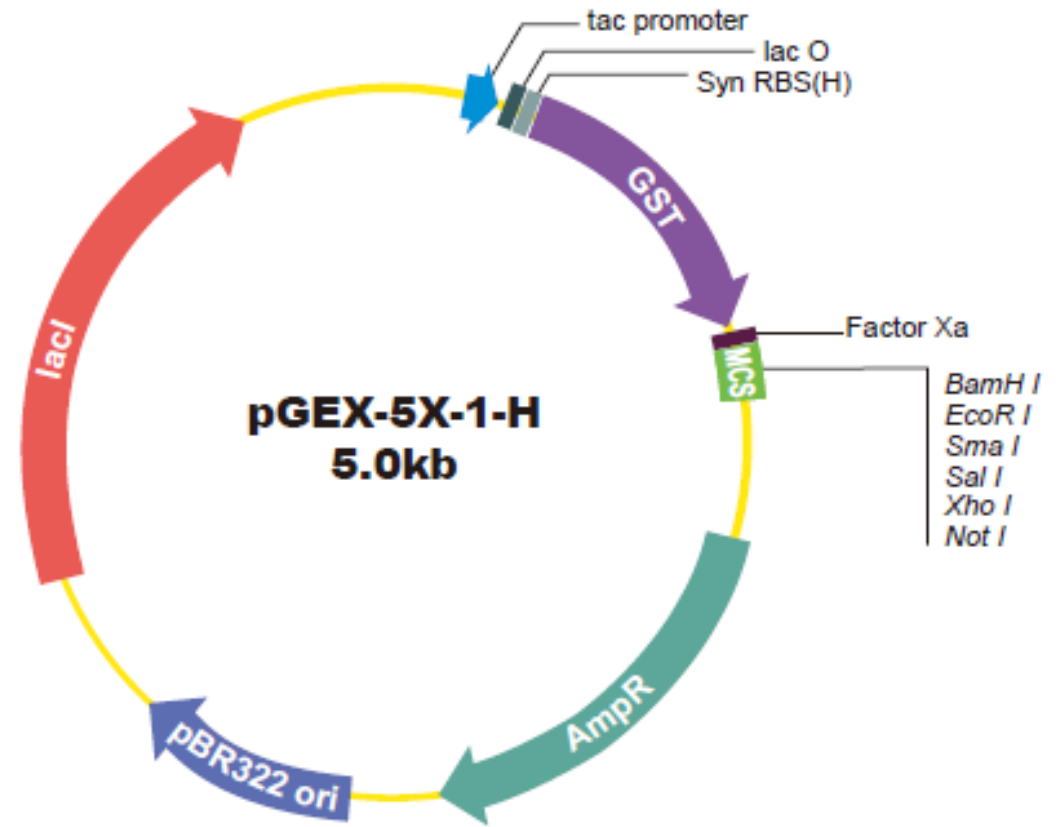


lac promoter → lac operator rbs GST tag
 --- TTG ACA ATT AAT CAT CCG CTC GTA TAA TGT GTG GAA TTG TGA GCG GAT AAC AAT TTC ACA CAG GAA ACA GTA TTC ATG TCC CCT ATA ... 621bp ... GGT
 M S P I ... 207aa ... G
 GST tag BamH I EcoR I Sma I Sal I Xho I Not I
 GGC GAC CAT CCT CCA AAA TCG GAT CTG GTT CCG CGT GGA TCC CCG AAT TCC CCG GTC GAC TCG AGC GGC CGC ATC GTG ACT GAC TGA CG ---
 G D H P P K S D L V P R G S P N S R V D S S R R I V T D Stop
 thrombin site

pGEX-5X-1



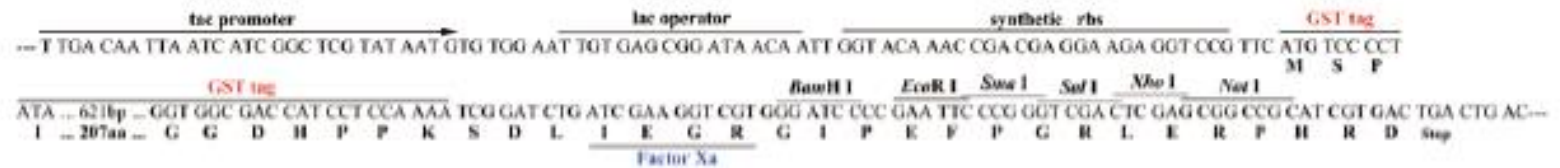
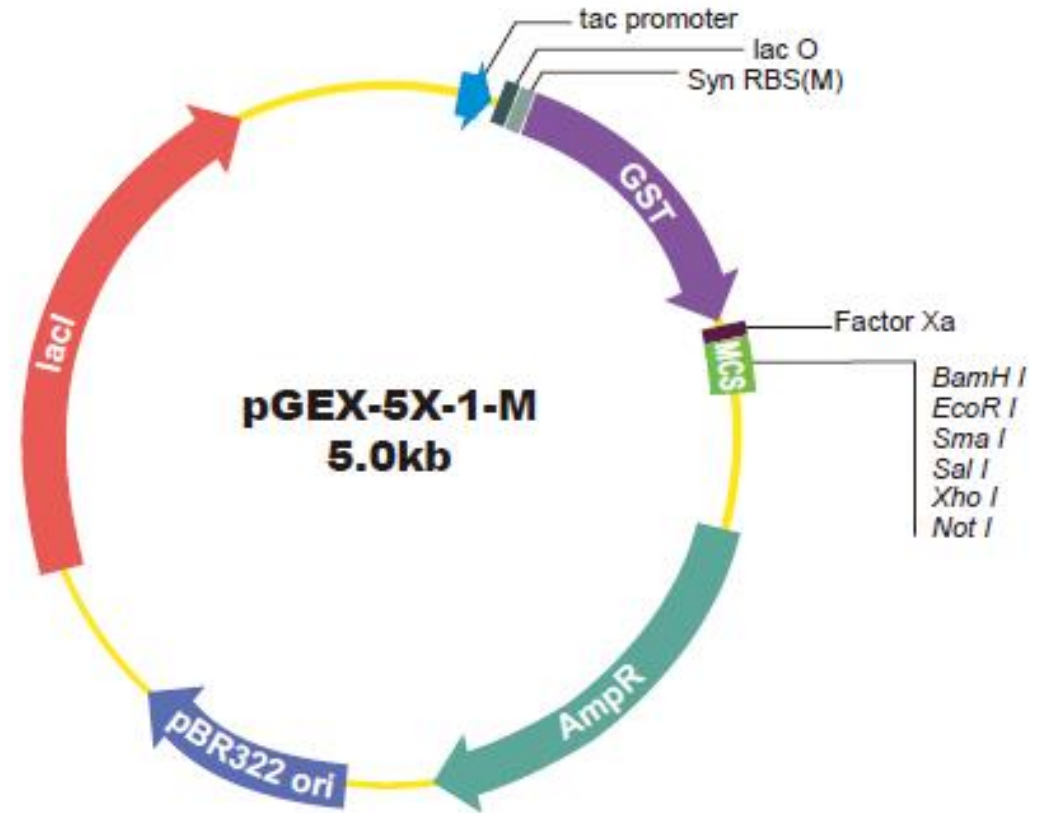
pGEX-5X-1-H



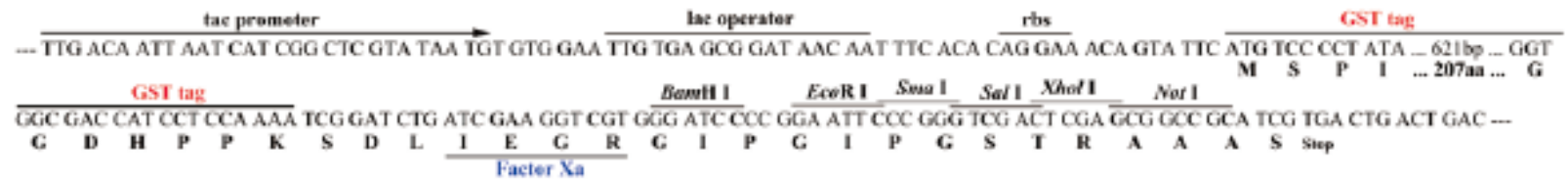
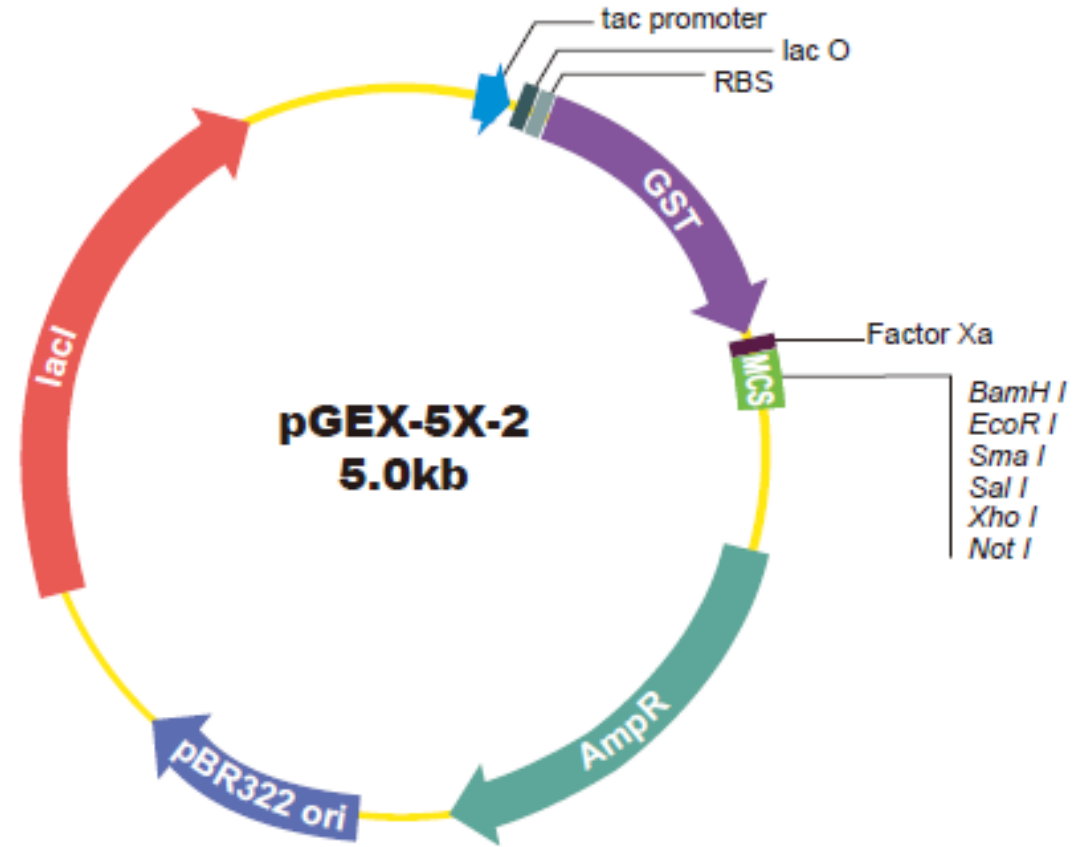
```

tac promoter      lac operator      synthetic rbs      GST tag
--- T TGA CAA TTA ATC ATC GGC TCG TAT AAT GTG TGG AAT TGT GAG CGG ATA ACA ATT CGG CAA AAT TAT ACA ACT AGG AGG TAT TTC ATG TCC CCT
                                     M S P
                                     BamHI  EcoRI  SmaI  SalI  XhoI  NotI
ATA ... 621bp ... GGT GGC GAC CAT CCT CCA AAA TCG GAT CTG ATC GAA GGT CGT GGG ATC CCC GAA TTC CCG GGT CGA CTC GAG CGG CCG CAT CGT GAC TGA CTG AC---
1 ... 207aa ... G G D H P P K S D L I E G R G I P E F P G R L E R P H R D stop
                                     Factor Xa
    
```

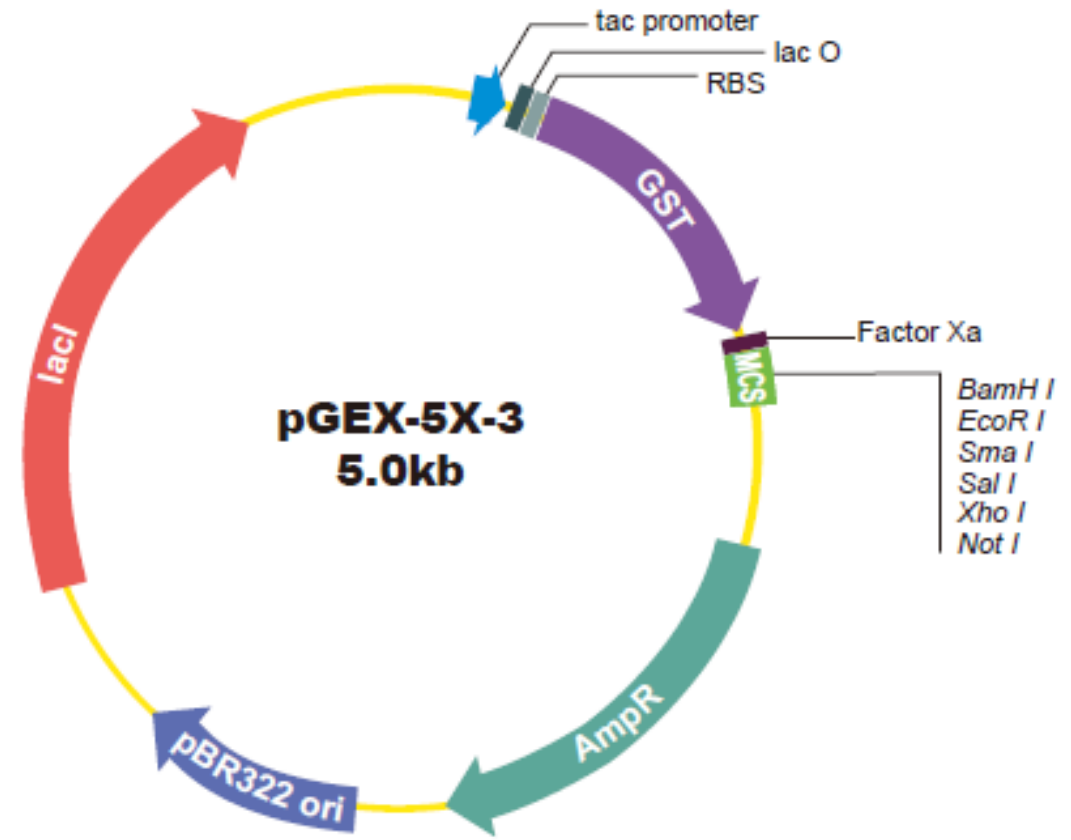
pGEX-5X-1-M



pGEX-5X-2

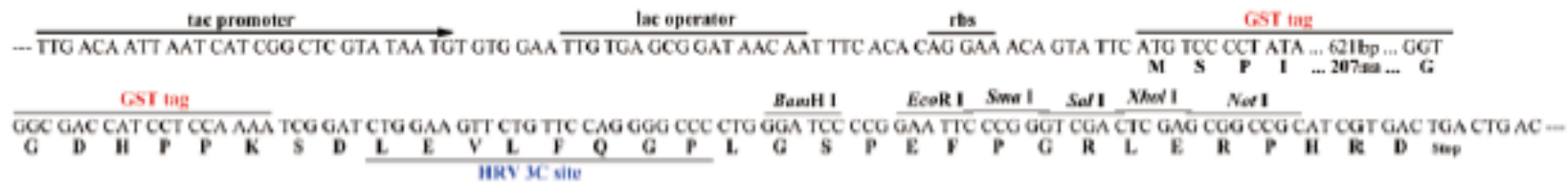
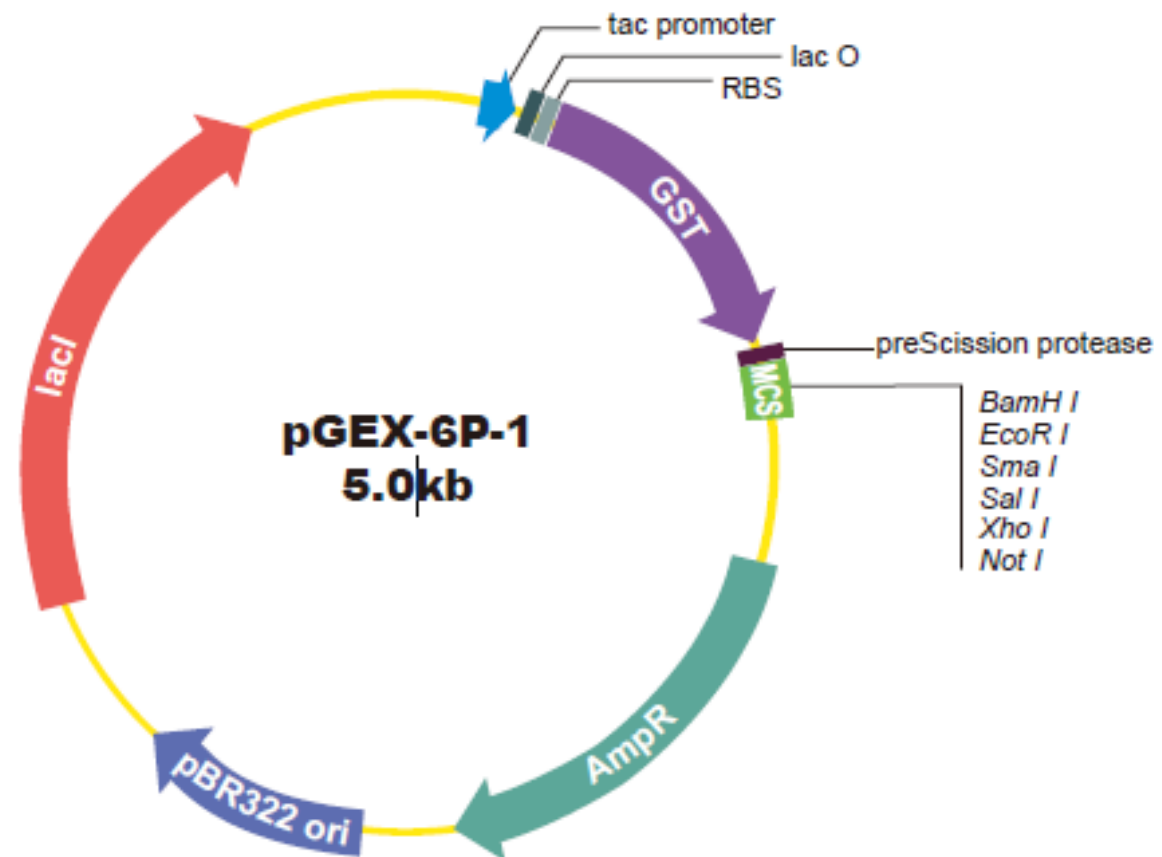


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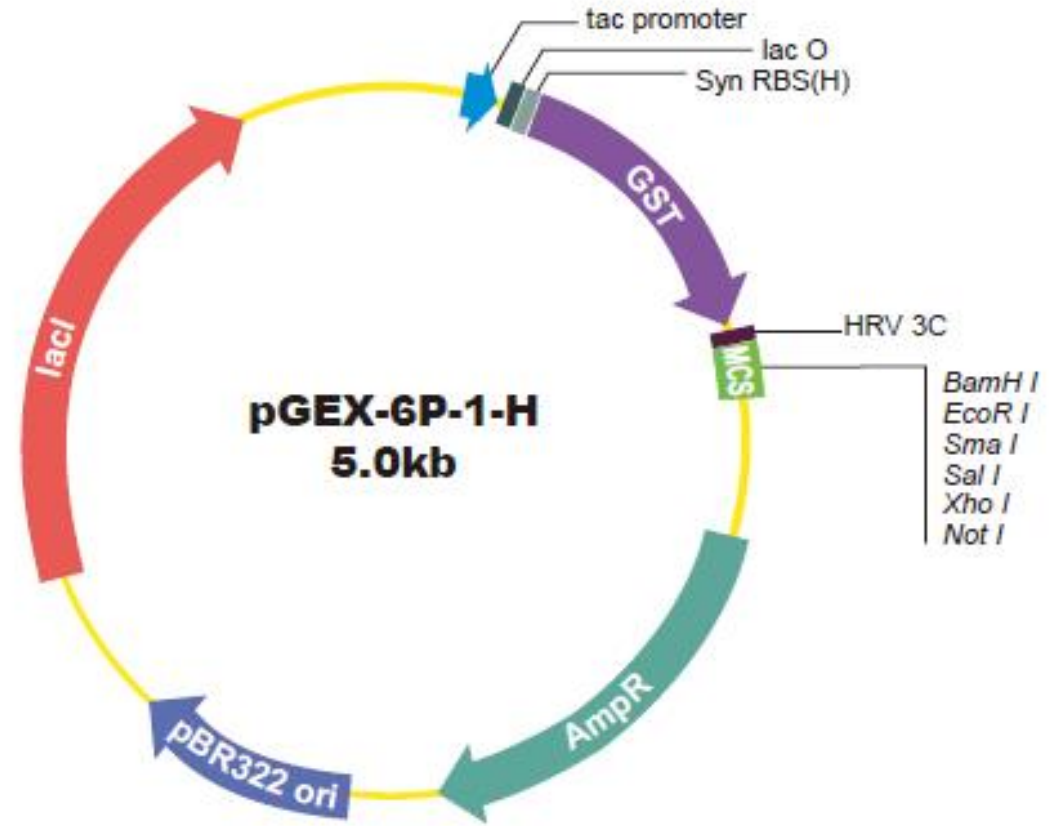


tac promoter → lac operator rbs GST tag
 --- TTG ACA ATT AAT CAT CGG CTC GTA TAA TGT GTG GAA TTG TGA GCG GAT AAC AAT TTC ACA CAG GAA ACA GTA TTC ATG TCC CCT ATA ... 621bp ... GGT
 M S P I ... 207aa ... G
 GST tag *BamHI* *EcoRI* *SmaI* *SalI* *XhoI* *NotI*
 GGC GAC CAT CCT CCA AAA TCG GAT CTG ATC GAA GGT CGT GGG ATC CCC AGG AAT TCC CGG GTC GAC TCG AGC GGC CGC ATC GTG ACT GAC TGA C ---
 G D H P P K S D L I E G R G I P R N S R V D S S G R I V T D Stop
 Factor Xa

pGEX-6P-1

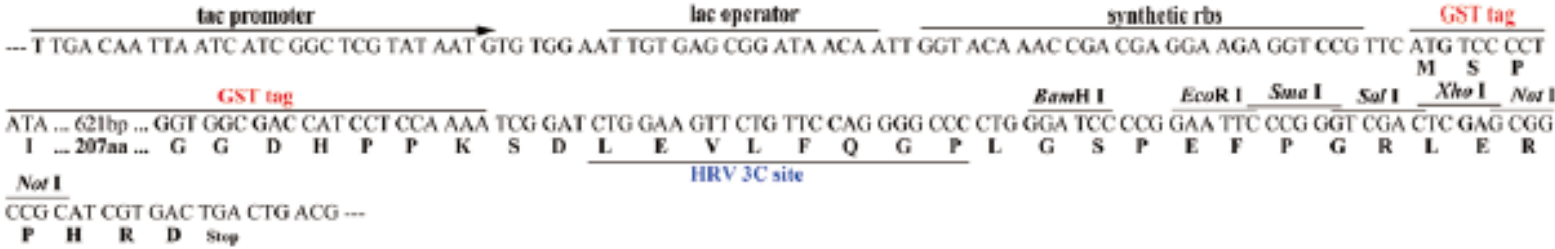
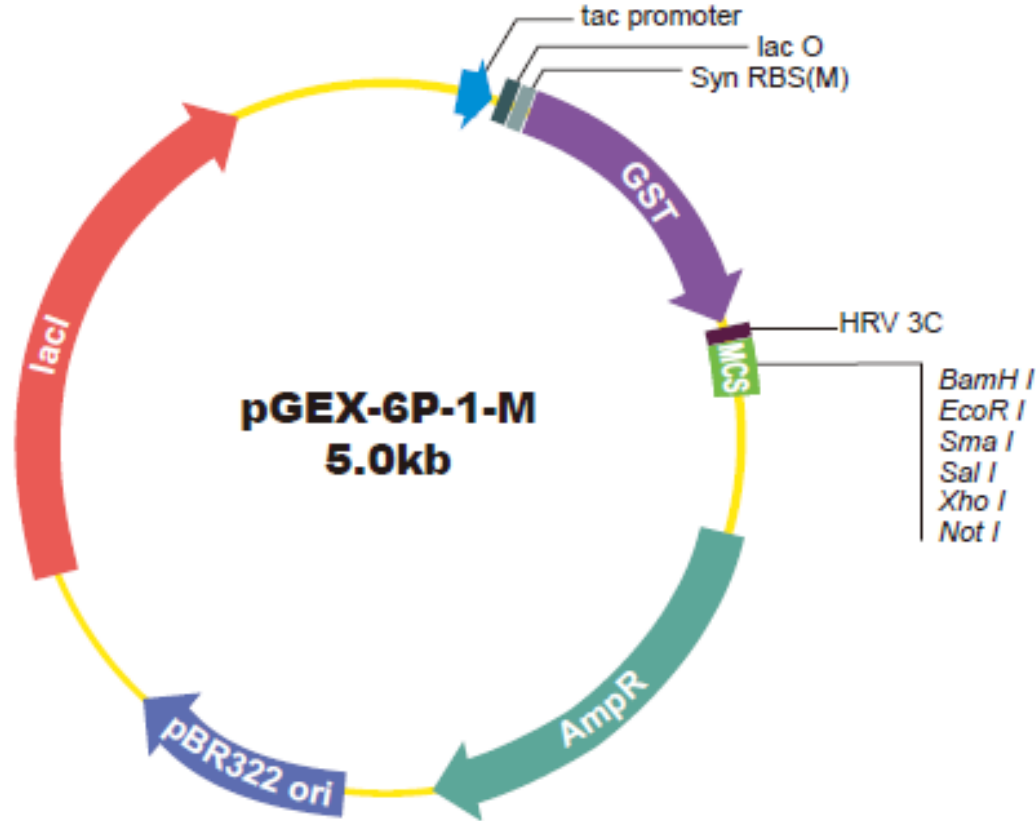


pGEX-6P-1-H

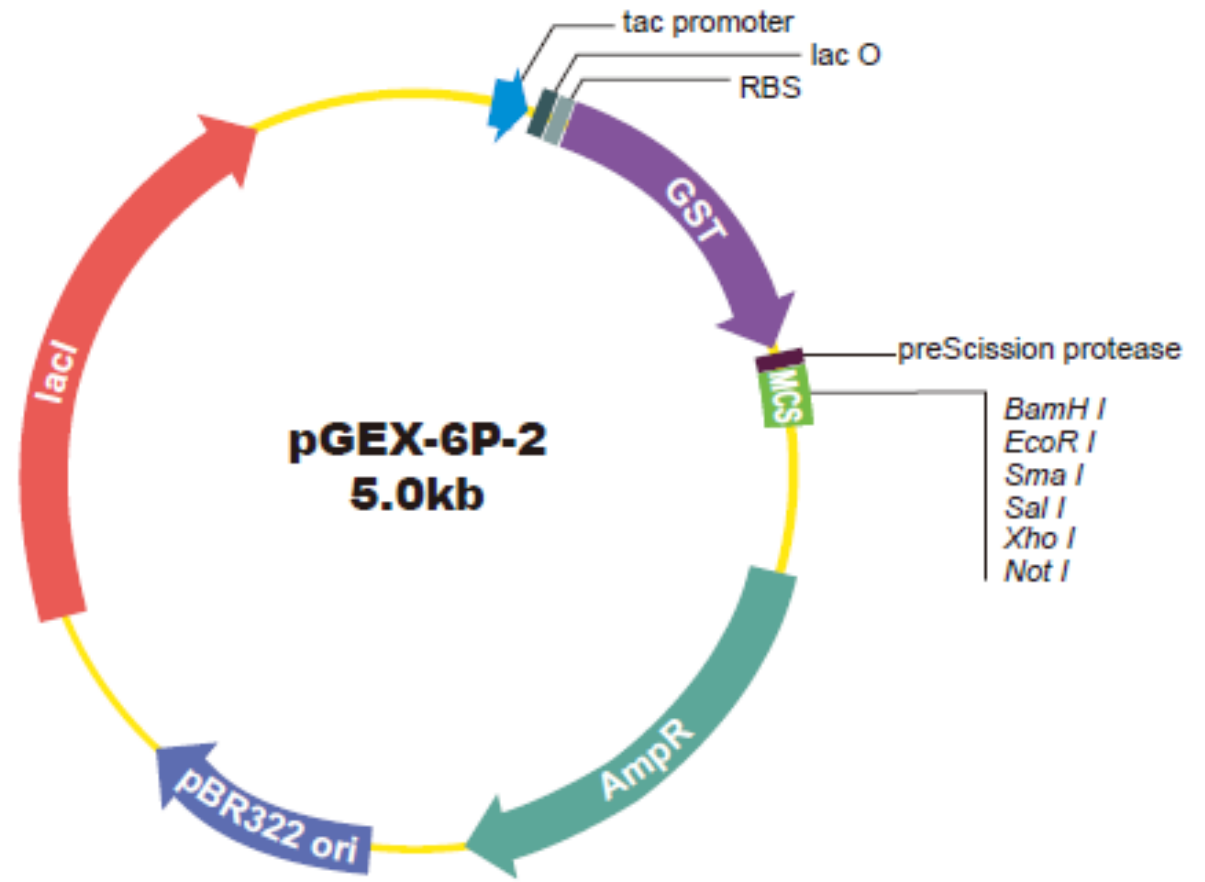


```
          tac promoter                lac operator                synthetic rbs                GST tag
-- TGA CAA TTA ATC ATC GGC TCG TAT AAT GTG TGG AAT TGT GAG CCG ATA ACA ATT CCG CAA AAT TAT ACA ACT AGG AGG TAT TTC ATG TCC CCT
                                     M S P
          GST tag                                BamH I    EcoR I    Sma I    Sal I    Xho I    Not I
ATA ... 621bp ... GGT GGC GAC CAT CCT CCA AAA TCG GAT CTG GAA GTT CTG TTC CAG GGG CCC CTG GGA TCC CCG GAA TTC CCG GGT CGA CTC GAG CCG
1 ... 207aa ...  G G  D  H  P  P  K  S  D  L  E  V  L  F  Q  G  P  L  G  S  P  E  F  P  G  R  L  E  R
          Nor I
CCG CAT CGT GAC TGA CTG ACG --
P H R D Stop
```

pGEX-6P-1-M

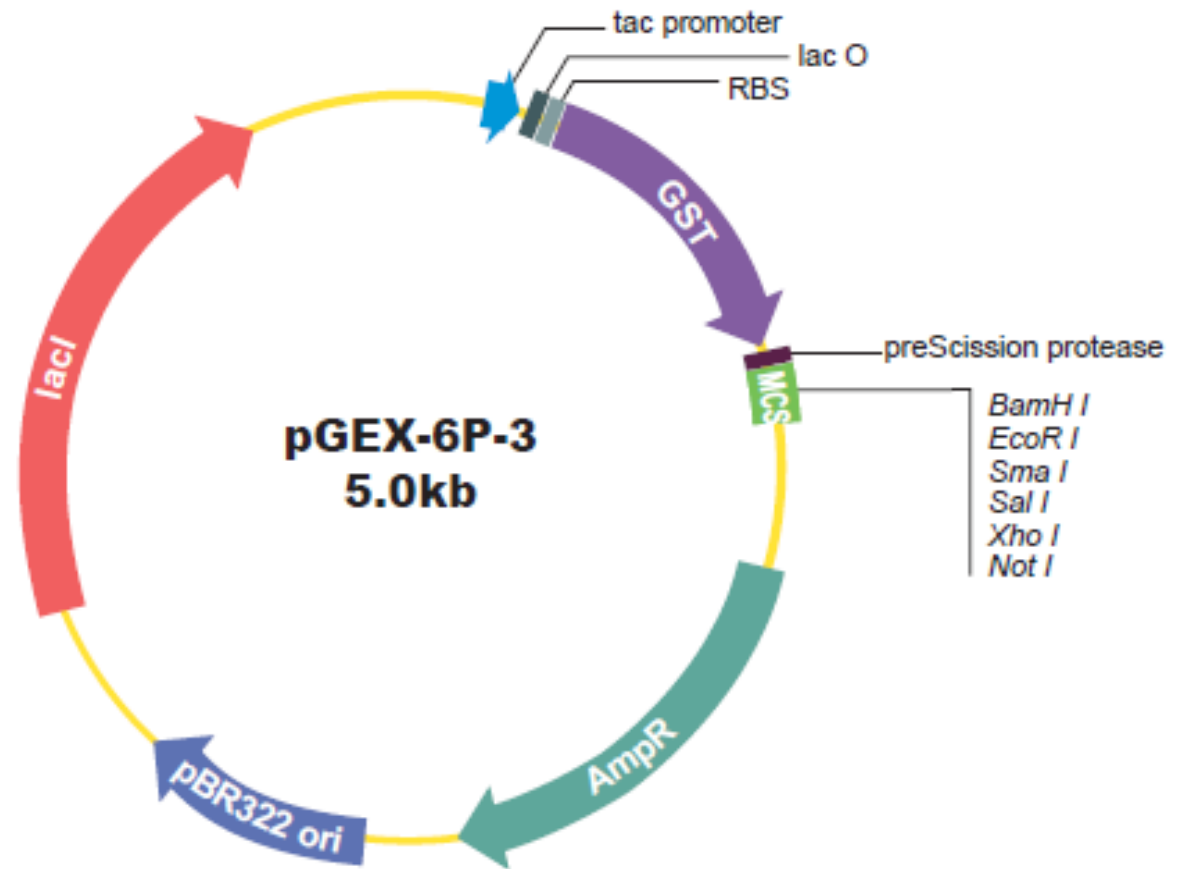


pGEX-6P-2



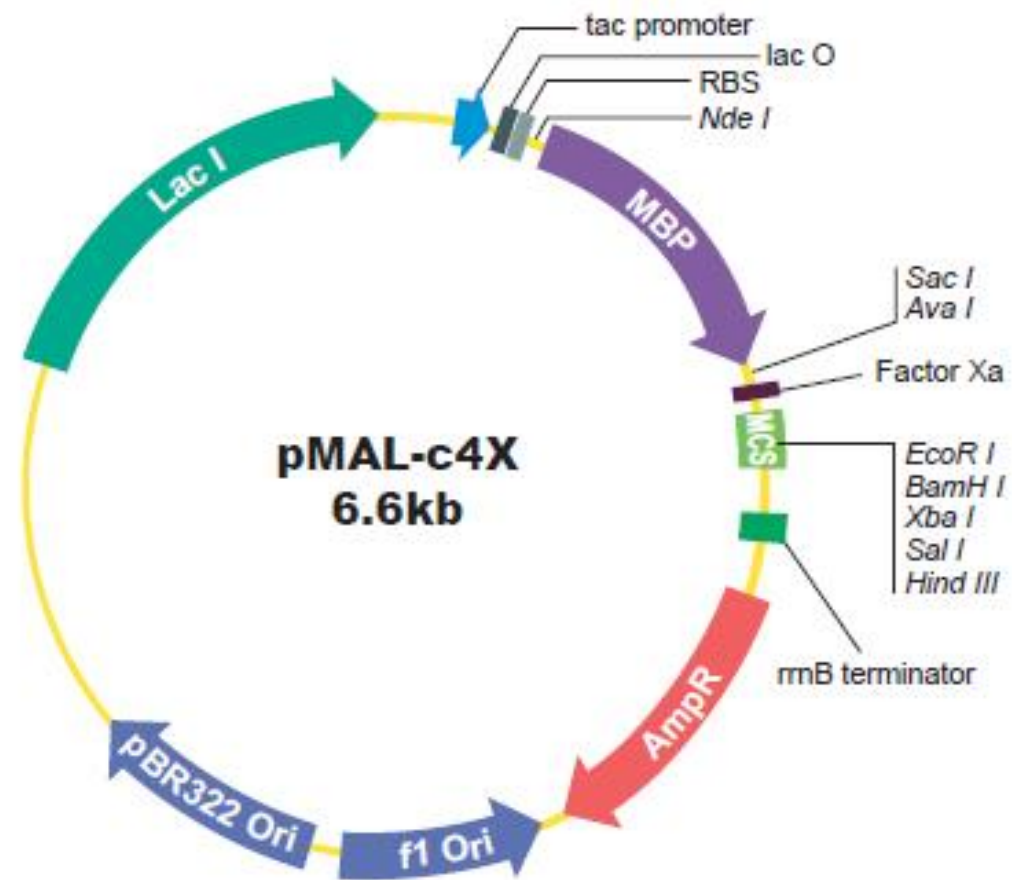
tac promoter	lac operator	rbs	GST tag
--- TTG ACA ATT AAT CAT CGG CTC GTA TAA TGT GTG GAA TTG TGA GCG GAT AAC AAT TTC ACA CAG GAA ACA GTA TTC ATG TCC CCT ATA ... 621bp ... GGT M S P I ... 207aa ... G			
GST tag		<i>BamH I</i>	<i>EcoR I</i> <i>Sma I</i> <i>Sal I</i> <i>Xho I</i> <i>Not I</i>
GGC GAC CAT CCT CCA AAA TCG GAT CTG GAA GTT CTG TTC CAG GGG CCC CTG GGA TCC CCA GGA ATT CCC GGG TCG ACT CGA GCG GCC GCA TCG TGA CTG ACT GAC --- G D H P P K S D L E V L F Q G P L G S P G I P G S T R A A A S Stop			
HRY 3C site			

pGEX-6P-3



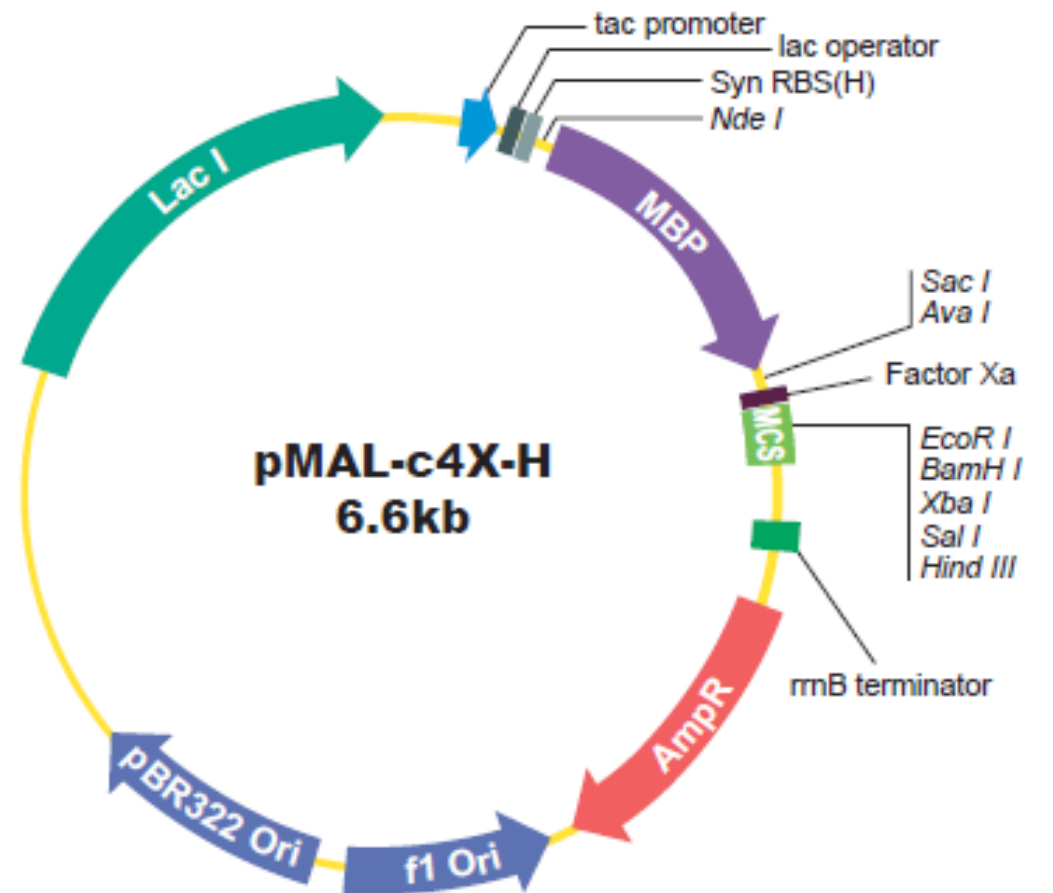
tac promoter → lac operator rbs GST tag
 --- TTG ACA ATT AAT CAT CCG CTC GTA TAA TGT GTG GAA TTG TGA GCG GAT AAC AAT TTC ACA CAG GAA ACA GTA TTC ATG TCC CCT ATA ... 621bp ... GGT
 M S P I ... 207aa ... G
 GST tag *BamH I* *EcoR I* *Sma I* *Sal I* *Xho I* *Not I*
 GGC GAC CAT CCT CCA AAA TCG GAT CTG GAA GTT CTG TTC CAG GGG CCC CTG GGA TCC CCG AAT TCC CGG GTC GAC TCG AGC GGC CGC ATC GTG ACT GAC TGA ---
 G D H P P K S D L E V L F Q G P L G S P N S R V D S S G R I V T D Stop
 HRV 3C site

pMAL-c4X



^{lac promoter}
 --- TT GAC AAT TAA TCA TCG GCT CGT ATA ATG TGT GGA ATT GTG AGC GGA TAA CAA TTT CAC ACA GGA AAC AGC CAG TCC GTT TAG GTG TTT TCA CGA GCA CTT
^{lac operator}
 CAC CAA CAA GGA CCA TAG CAT ATG AAA ATC GAA ... 1068bp ... GCC CTG AAA GAC GCG CAG ACT AAT TCG AGC TCG AAC AAC AAC AAC AAT AAC AAT AAC AAC
^{rbs} ^{Nde I} ^{MBP} ^{Sac I}
 M K I E ... 356aa ... A L K D A Q T N S S S N N N N N N N N N N
^{Ara I} ^{EcoR I} ^{BamH I} ^{Xba I} ^{Sal I} ^{Hind III}
 AAC CTC GGG ATC GAG GGA AGG ATT TCA GAA TTC GGA TCC TCT AGA GTC GAC CTG CAG GCA AGC TTG GCA CTG GCC GTC GTT TTA ---
 N L G I E G R I S E F G S S R V D L Q A S L A L A V V L
^{Factor Xa}

pMAL-c4X-H



lac promoter → **lac operator** **synthetic rbs**

```
-- T TGA CAA TTA ATC ATC GCC TCG TAT AAT GTG TGG AAT TGT GAG CCG ATA ACA ATT GAA CAA GAA CAA AGC TTA AGG AGG TAA
```

Nde I **MBP** *Sac* I

```
CAT ATG AAA ATC GAA ... 1068bp ... GCC CTG AAA GAC GCG CAG ACT AAT TGG AGC TCG AAC AAC AAC AAC AAT AAC AAT AAC AAC
```

M K I E ... 356aa ... A L K D A Q T N S S S N N N N N N N N N

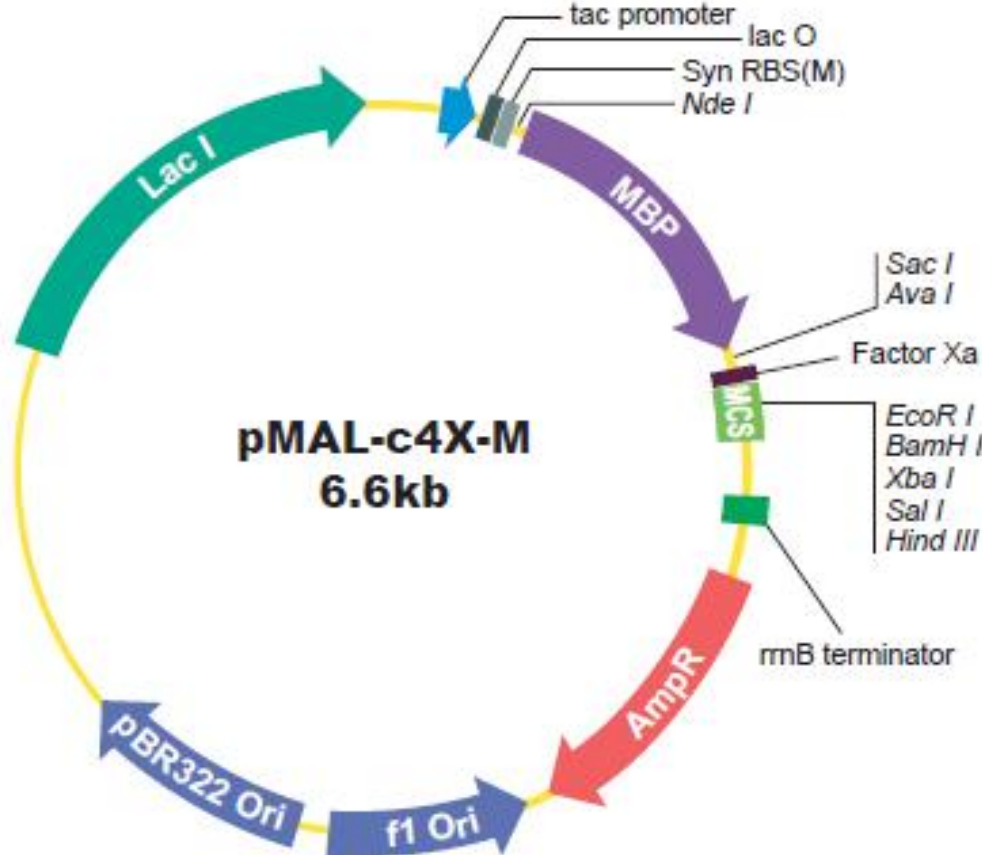
Arg I *Eco*R I *Bam*H I *Xba* I *Sal* I *Hind* III

```
AAC CTC GGG ATC GAG GGA AGG ATT TCA GAA TTC GGA TCC TCT AGA GTC GAC CTG CAG GCA AGC TTG GCA CTG GCC GTC GTT TTA --
```

N L G I E G R I S E F G S S R V D L Q A S L A L A V V L

Factor Xa

pMAL-c4X-M

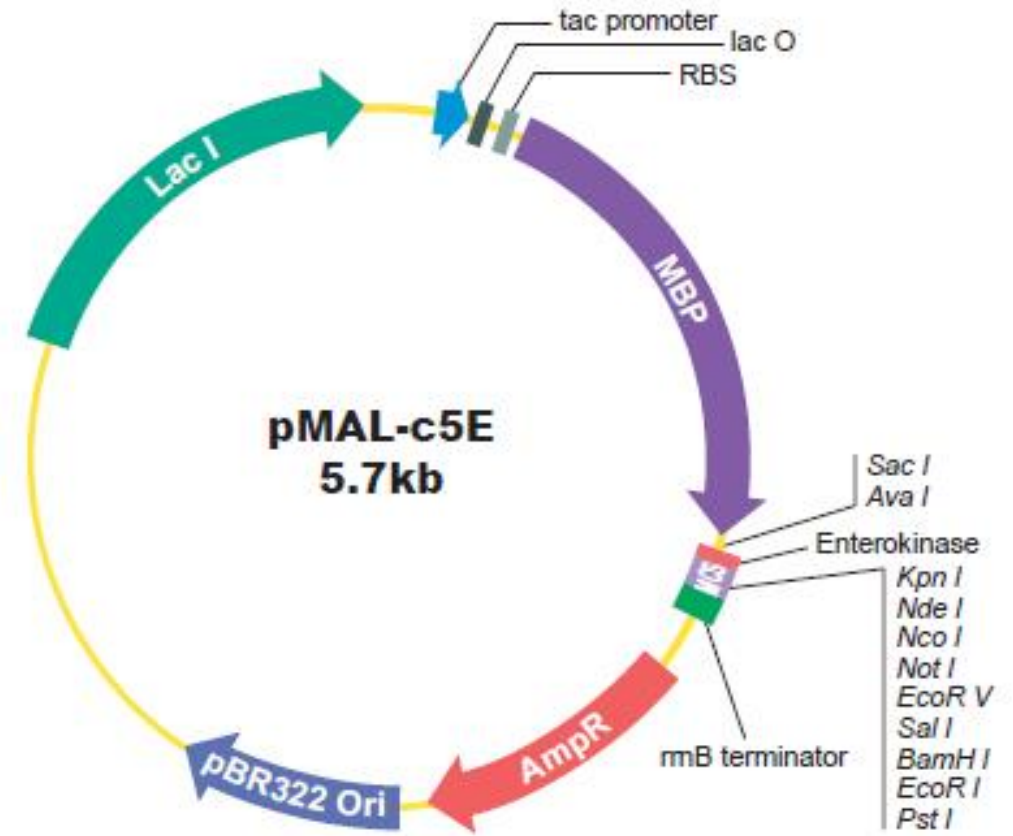


```

tac promoter                    lac operator                    synthetic rbs
--T TGA CAA TTA ATC ATC GCC TCG TAT AAT GTG TGG AAT TGT GAG CGG ATA ACA ATT AAA ACA TAT AGG ACT TAA TAG GGG GAG
Nde I                               Sac I
CAT ATG AAA ATC GAA ... 1068bp ... GCC CTG AAA GAC GCG CAG ACT AAT TCG AGC TCG AAC AAC AAC AAT AAC AAT AAC AAC
M K I E ... 356aa ... A L K D A Q T N S S S S N N N N N N N N N N
Ara I                               EcoR I  BamH I  Xba I  Sal I                               Hind III
AAC CTC GGG ATC GAG OGA AGG ATT TCA GAA TTC OGA TCC TCT AGA GTC GAC CTG CAG GCA AGC TTG GCA CTG GCC GTC GTT TTA --
N L G I E G R I S E F G S S R V D L Q A S L A L A Y V L
Factor Xa

```

pMAL-c5E

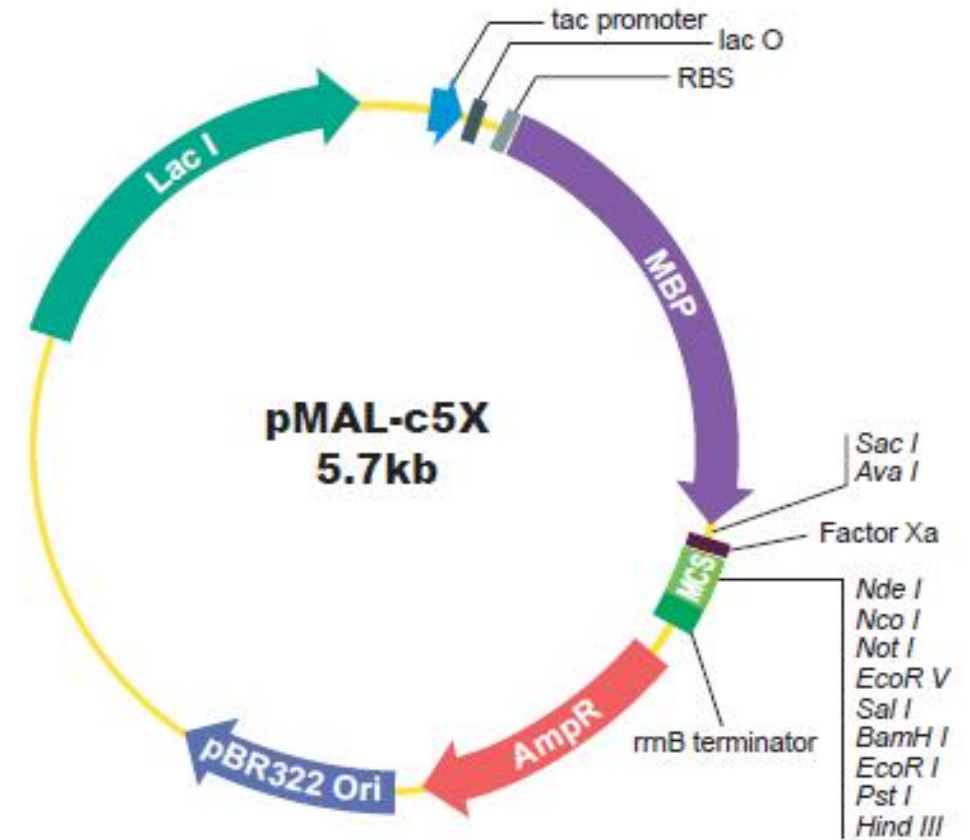


$\xrightarrow{\text{tac promoter}}$ $\xrightarrow{\text{lac operator}}$
 --- TT GAC AAT TAA TCA TCG GCT CGT ATA ATG TGT GGA ATT GTG AGC GGA TAA CAA TTT CAC ACA GGA AAC AGC CAG TCC GTT TAG GTG TTT TCA CGA GCA ATT

 $\xrightarrow{\text{rbs}}$ $\xrightarrow{\text{MBP}}$ $\xrightarrow{\text{Sac I}}$
 GAC CAA CAA GGA CCA TAG ATT ATG AAA ATC GAA ... 1068bp ... GCC CTG AAA GAC GCG CAG ACT AAT TCG AGC TCG AAC AAC AAC AAC AAT AAC AAT AAC AAC
 M K I E ... 356aa ... A L K D A Q T N S S S N N N N N N N N N N

 $\xrightarrow{\text{Ara I}}$ $\xrightarrow{\text{Kpn I}}$ $\xrightarrow{\text{Nde I}}$ $\xrightarrow{\text{Nco I}}$ $\xrightarrow{\text{Not I}}$ $\xrightarrow{\text{EcoR V}}$ $\xrightarrow{\text{Sal I}}$ $\xrightarrow{\text{BamH I}}$ $\xrightarrow{\text{EcoR I}}$ $\xrightarrow{\text{Pst I}}$ $\xrightarrow{\text{Hind III}}$
 AAC CTC GGG GAT GAC GAT GAC AAG GTA CCG CAT ATG TCC ATG GGC GGC CGC GAT ATC GTC GAC GGA TCC GAA TTC CTT GCA GGT AAT TAA ATA AGC TTC ---
 N L G D D D D K V P H M S M G G R D I V D G S E E P A G N Sep
 enterokinase site

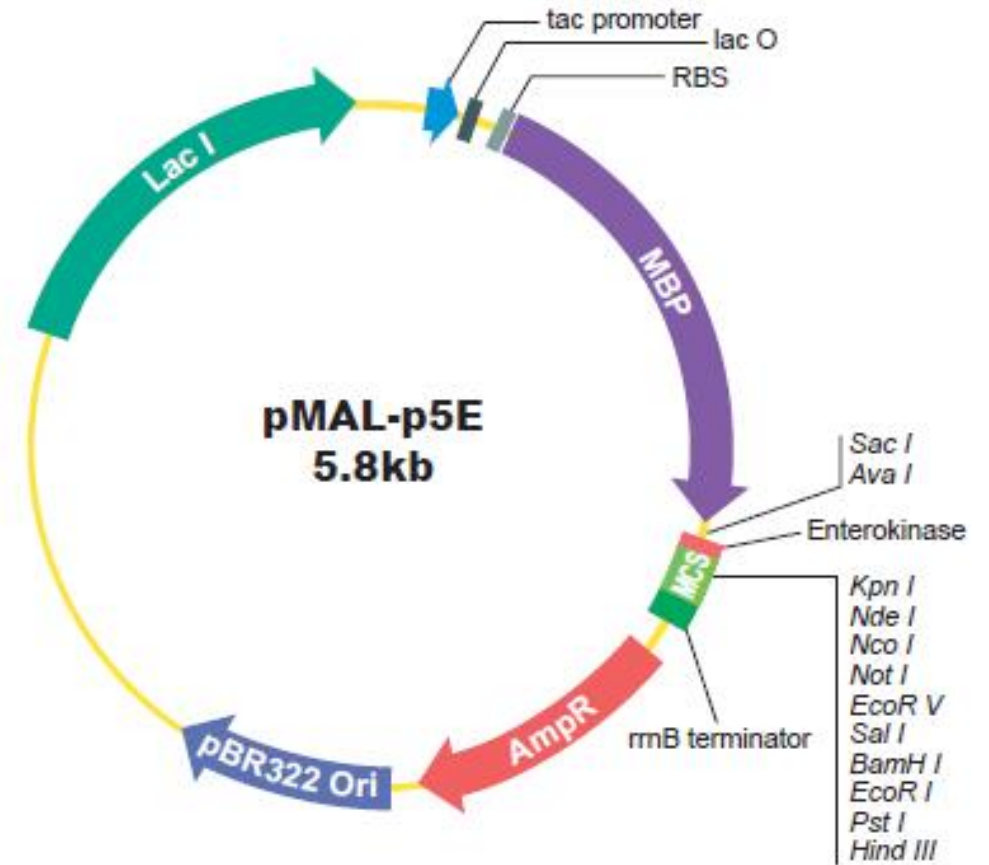
pMAL-c5X



```

lac promoter          lac operator
-- TT GAC AAT TAA TCA TCG GCT CGT ATA ATG TGT GGA ATT GTG AGC GGA TAA CAA TTT CAC ACA GGA AAC AGC CAG TCC GTT TAG GTG TTT TCA CGA GCA ATT
                                     rbs          MBP          Sac I
GAC CAA CAA GGA CCA TAG ATT ATG AAA ATC GAA ... 1068bp ... GCC CTG AAA GAC GCG CAG ACT AAT TCG AGE TCG AAC AAC AAC AAT AAC AAT AAC AAC
                                     M K I E ... 356aa ... A L K D A Q T N S S S S N N N N N N N N
                                     Ara I          Nde I    Nco I    Not I    EcoR V    Sal I    BamH I    EcoR I    Pst I          Hind III
AAC CTC GGG ATC GAG OGA AGG ATT TCA CAT ATG TCC ATG GGC GGC CGC GAT ATC GTC GAC OGA TCC GAA TTC CCT GCA GGT AAT TAA ATA AGC TT ---
                                     N L G I E G R I S H M S M G G R D I V D G S E F P A G N Stop
                                     Factor Xa
    
```

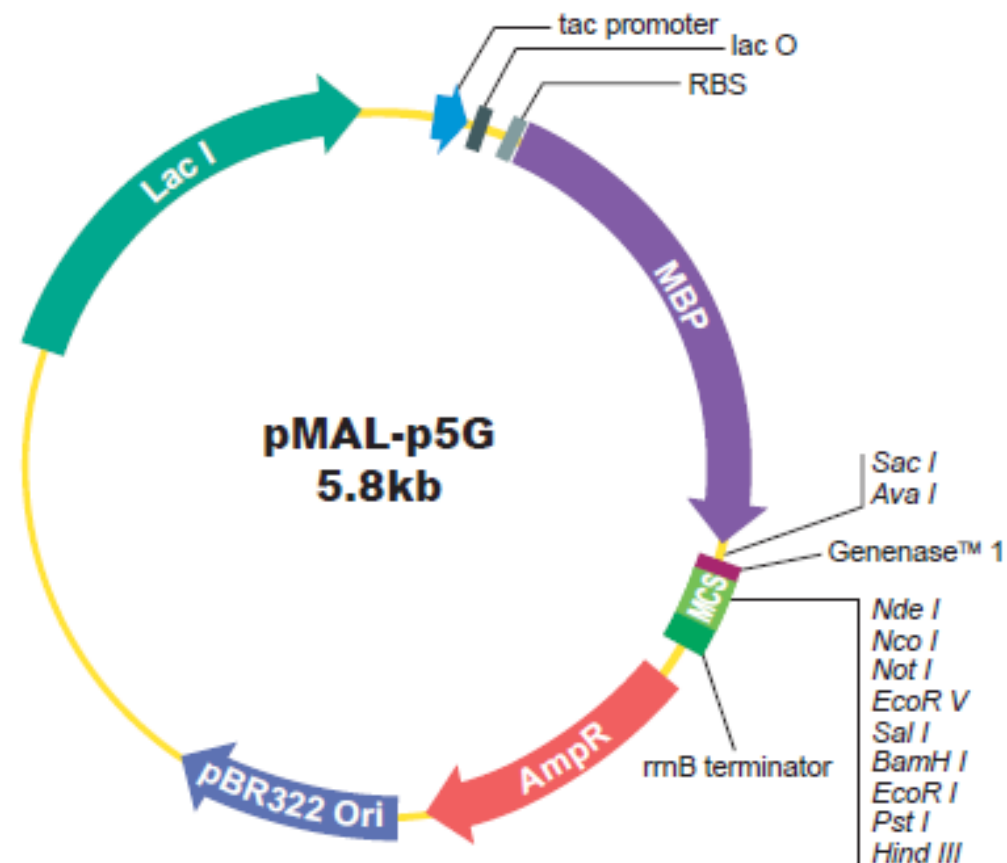
pMAL-p5E



```

lac promoter          lac operator
-- TT GAC AAT TAA TCA TCG GCT CGT ATA ATG TGT GGA ATT GTG AGC GG A TAA CAA TTT CAC ACA GGA AAC AGC CAG TCC GTT TAG GTG TTT TCA CGA GCA ATT
rbs                    MBP                    Sac I
GAC CAA CAA GGA CCA TAG ATT ATG AAA ATA AAA ... 1068bp ... GCC CTG AAA GAC GCG CAG ACT AAT TCG AGC TCG AAC AAC AAC AAT AAC AAT AAC AAC
M K I K ... 356aa ... A L K D A Q T N S S S S N N N N N N N N N N
Ara I          Kpn I      Nde I      Nco I      Not I      EcoR V      Sal I      BamH I      EcoR I      Pst I          Hind III
AAC CTC GGG GAT GAC GAT GAC AAG GTA CCG CAT ATG TCC ATG GGC GGC CGC GAT ATC GTC GAC GGA TCC GAA TTC CCT GCA GGT AAT TAA ATA AGC TTC ---
N L G D D D D K V P H M S M G G R D I V D G S E E F P A G N Stop
enterokinase site
  
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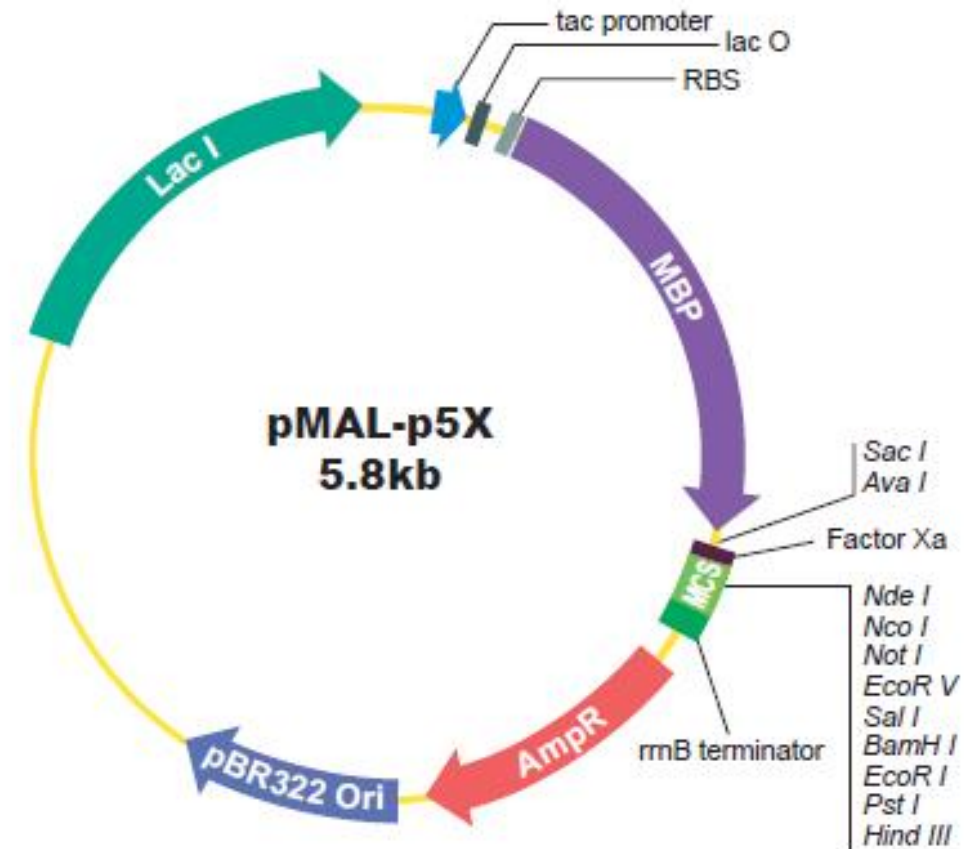
pMAL-p5G



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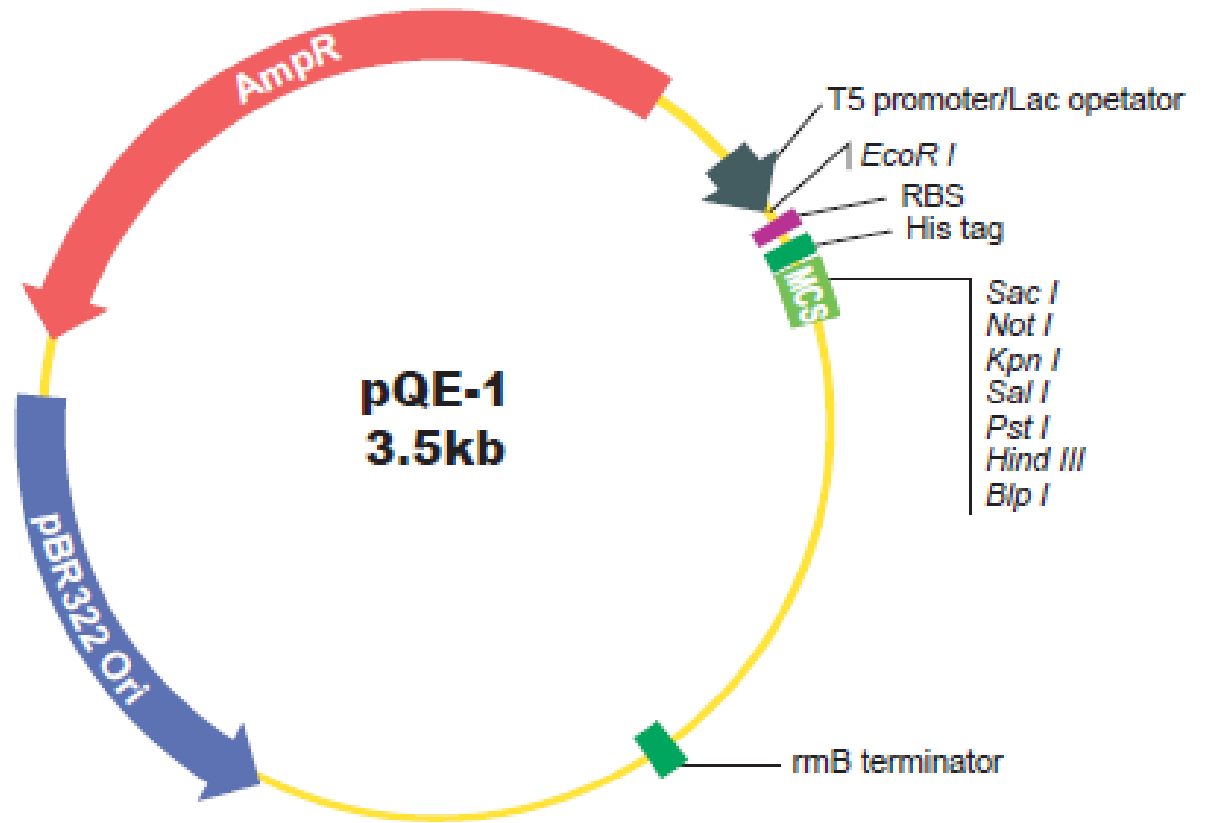
          tac promoter                      lac operator
-- TT GAC AAT TAA TCA TCG GCT CGT ATA ATG TGT GGA ATT GTG AGC GGA TAA CAA TTT CAC ACA GGA AAC AGC CAG TCC GTT TAG GTG TTT TCA CGA GCA ATT
          rbs                                MBP                                Sac I
GAC CAA CAA GGA CCA TAG ATT ATG AAA ATA AAA ... 1068bp ... GCC CTG AAA GAC GCG CAG ACT AAT TCG AGC TCG AAC AAC AAC AAT AAC AAT AAC AAC
          M  K  I  K ... 356aa ...  A  L  K  D  A  Q  T  N  S  S  S  N  N  N  N  N  N  N  N  N  N
          Ara I                               Kpn I   Nde I   Neo I   Not I   EcoR V   Sal I   BamH I   EcoR I   Pst I                               Hind III
AAC CTC GGG GAT GAC GAT GAC AAG GTA CCG CAT ATG TCC ATG GGC GGC CGC GAT ATC GTC GAC GGA TCC GAA TTC CCT GCA GGT AAT TAA ATA AGC TTC ---
          N  L  G  D  D  D  D  K  V  P  H  M  S  M  G  G  R  D  I  V  D  G  S  E  F  P  A  G  N  Stop
          enterokinase site
    
```

pMAL-p5X



^{tac promoter}
 -- TT GAC AAT TAA TCA TCG GCT CGT ATA ATG TGT GGA ATT GTG AGC GGA TAA CAA TTT CAC ACA GGA AAC AGC CAG TCC GTT TAG GTG TTT TCA CGA GCA ATT
^{lac operator}
^{rbs} GAC CAA CAA GGA CCA TAG ATT ATG AAA ATA AAA ... 1068bp ... GCC CTG AAA GAC GCG CAG ACT AAT TCG AGC TCG AAC AAC AAC AAC AAT AAC AAT AAC AAC
^{MBP} M K I K ... 356aa ... A L K D A Q T N S S S S N N N N N N N N N N
^{Sac I}
^{Ara I} AAC CTC GGG ATC GAG GGA AGG ATT TCA CAT ATG TCC ATG GGC GGC CGC GAT ATC GTC GAC GGA TCC GAA TTC CCT GCA GGT AAT TAA ATA AGC TT ...
^{Nde I} N L G I E G R I S H M S M G G R D I V D G S E F P A G N Stop
^{Nco I}
^{Not I}
^{EcoR V}
^{Sal I}
^{BamH I}
^{EcoR I}
^{Pst I}
^{Hind III}
^{Factor Xa}

pQE-1



T5 promoter / lac operator
 --- TCA TAA AAA ATT TAT TTG CTT TGT GAG CCG ATA ACA ATT ATA ATA GAT TCA ATT GTG AGC GGA TAA CAA TTT CAC ACA GAA TTC ATT AAA GAG GAG AAA

lac operator
 TTA ACT ATG AAA CAT CAC CAT CAC CAT CAC CAG CTG CAT GCG GGA GGT CAT GCG GCC GCG GGT ACC CAC GTG TCG ACC TGC AGA AGC TTA ATT AGC TGA GCT

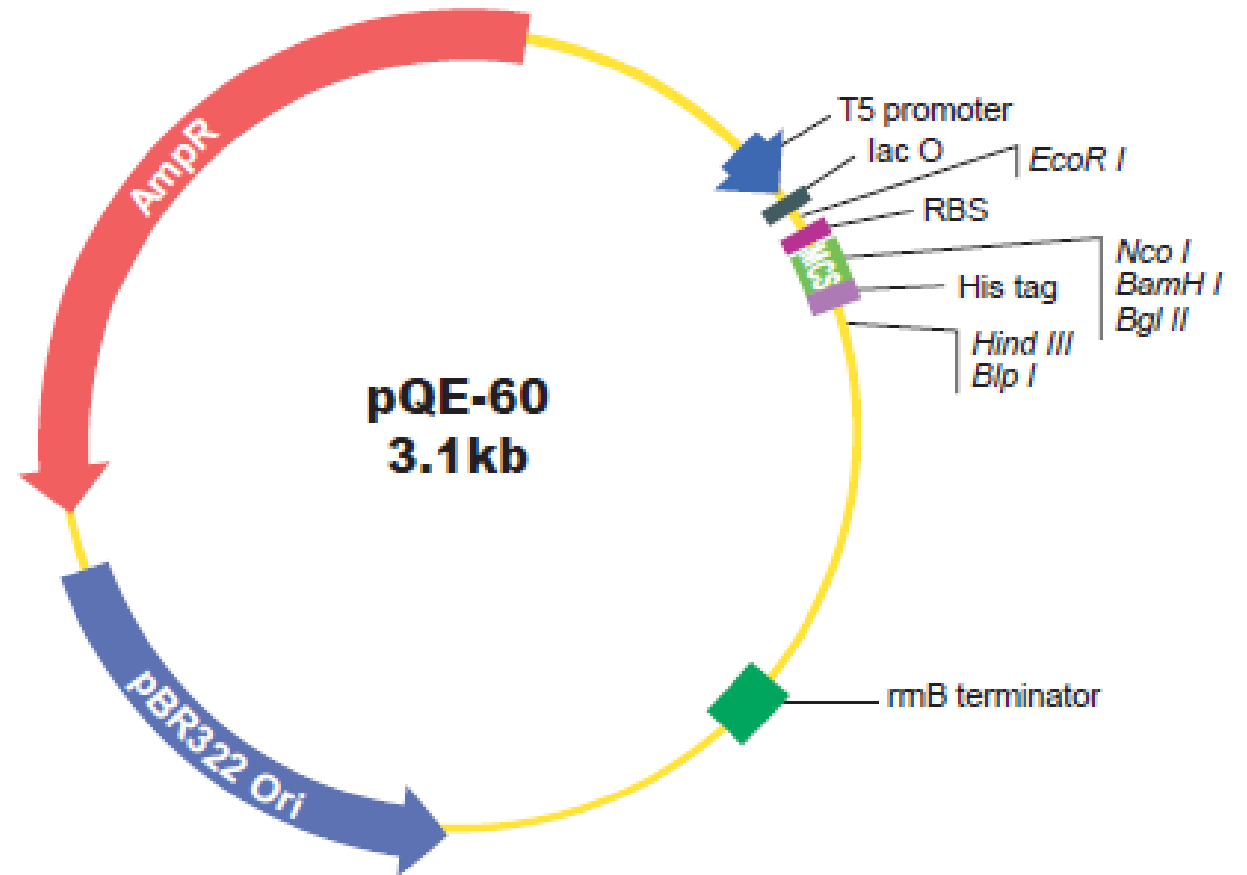
His tag
 M K H H H H H Q L H A G A H A A A G T H V S T C R S L I S Stop

EcoRI
 TCA TAA AAA ATT TAT TTG CTT TGT GAG CCG ATA ACA ATT ATA ATA GAT TCA ATT GTG AGC GGA TAA CAA TTT CAC ACA GAA TTC ATT AAA GAG GAG AAA

rbs
 TTA ACT ATG AAA CAT CAC CAT CAC CAT CAC CAG CTG CAT GCG GGA GGT CAT GCG GCC GCG GGT ACC CAC GTG TCG ACC TGC AGA AGC TTA ATT AGC TGA GCT

lambda 10 terminator
 TGG ACT CCT GTT GAT AGA TCC AGT AAT GAC CTC AGA ACT CCA TCT GGA TTT GTT CAG AAC GCT CCG TTG CCG CCG GGC GTT TTT TAT TGG TGA GAA T ---

pQE-60

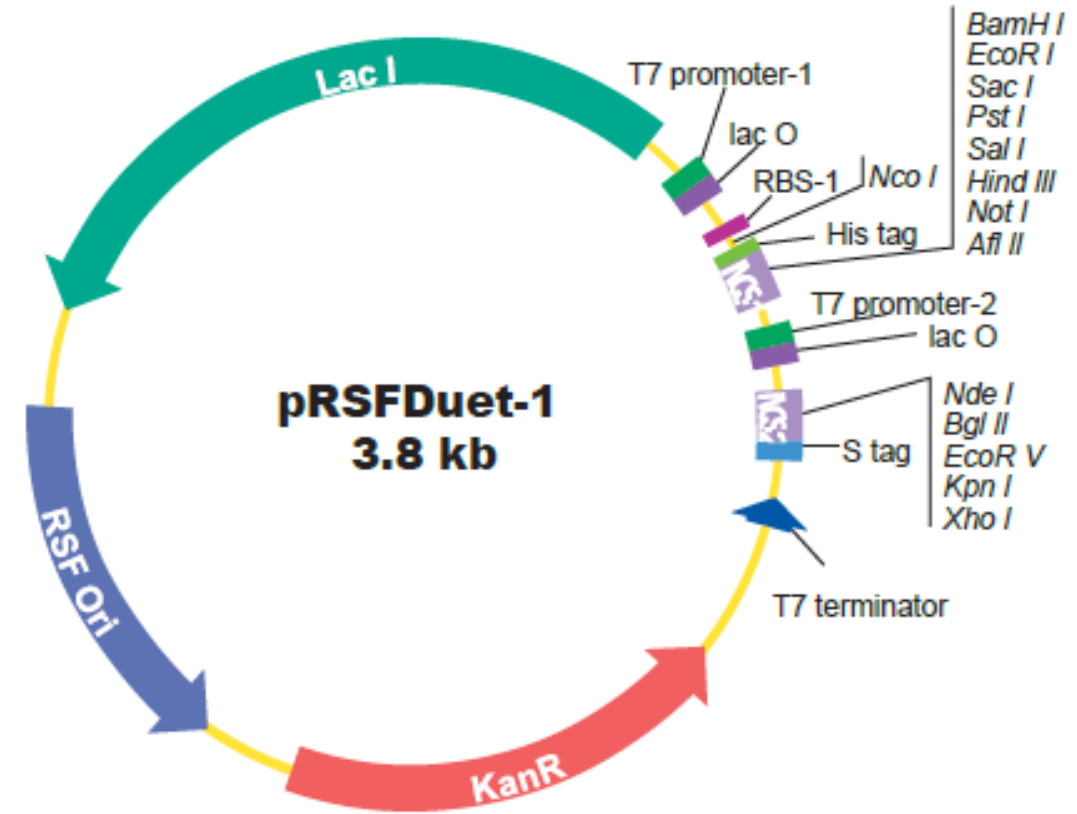


T5 promoter / lac operator
 --- TCA TAA AAA ATT TAT TTG CTT TGT GAG CGG ATA ACA ATT ATA ATA GAT TCA ATT GTG AGC GGA TAA CAA TTT CAC ACA GAA TTC ATT AAA GAG GAG AAA ---

Nco I BamH I Bgl II His tag Hind III Bsp I lambda 01 terminator
 TTA ACC ATG GGA GGA TCC AGA TCT CAT CAC CAT CAC CAT CAC TAA GCT TAA TTA GCT GAG CTT GGA CTC CTG TTG ATA GAT CCA GTA ATG ACC TCA GAA
 M G G S R S H H H H H H Stop

lambda 01 terminator
 CTC CAT CTG GAT TTG TTC AGA ACG CTC GGT TGC CGC CGG GCG TTT TTT ATT GGT GAG AAT ---

pRSFDuet-1



MCS-1 : 3992-172

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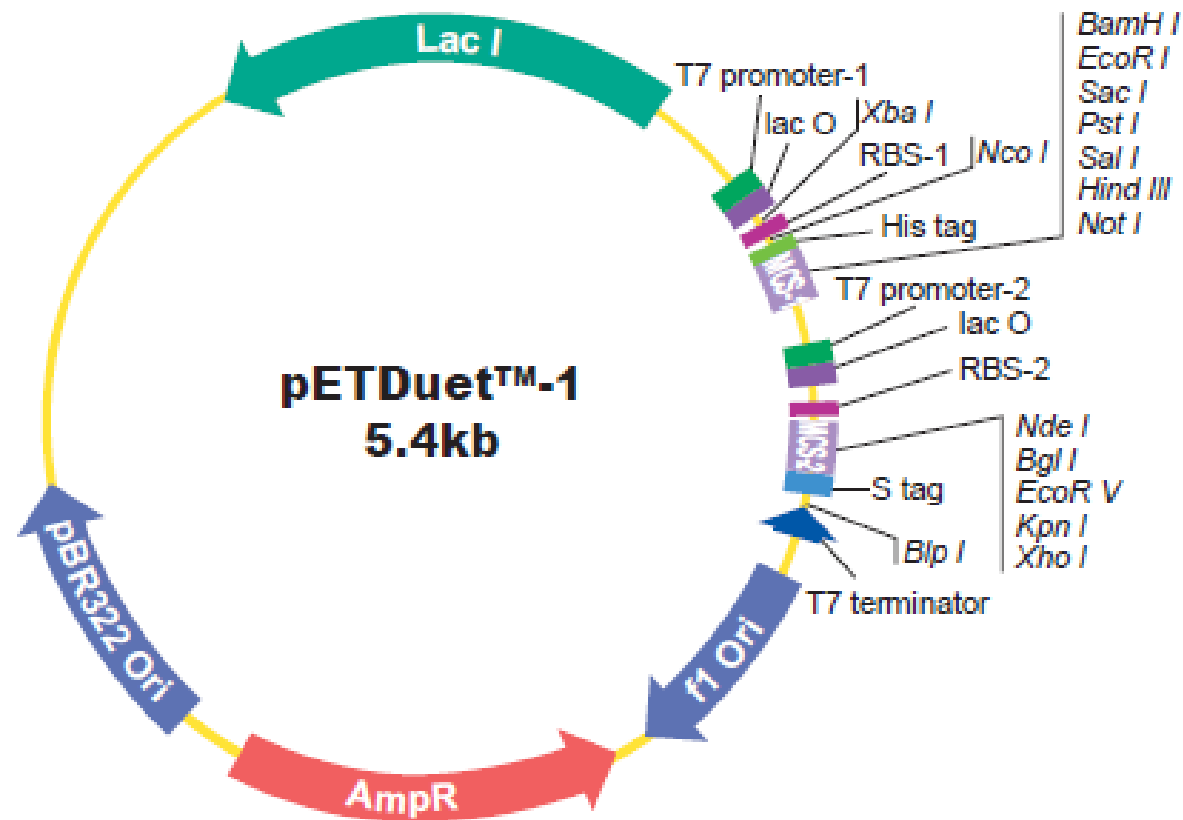
T7 promoter          lac operator          rbs
--- TAA TAC GAC TCA CTA TAG GGG AAT TGT GAG CGG ATA ACA ATT CCC CTG TAG AAA TAA TTT TGT TTA ACT TTA ATA AGG AGA TAT ACC
Nco I              His tag              BamH I   EcoR I   Sac I              Pst I   Sal I   Hind III   Not I
ATG GGC AGC AGC CAT CAC CAT CAT CAC CAC AGC CAG GAT CCG AAT TCG AGC TCG GCG CGC CTG CAG GTC GAC AAG CTT GCG GCC GCA
M  G  S  S  H  H  H  H  H  H  S  Q  D  P  N  S  S  S  A  R  L  Q  V  D  K  L  A  A  A
Afl II
TAA TGC TTA AGT CGA ---
Stop
    
```

MCS-2: 214-440

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T7 promoter          lac operator          rbs
--- TA ATA CGA CTC ACT ATA GGG GAA TTG TGA GCG GAT AAC AAT TCC CCA TCT TAG TAT ATT AGT TAA GTA TAA GAA GGA GAT ATA
Nde I   Bgl II          EcoR V          Kpn I   Xho I          S tag
CAT ATG GCA GAT CTC AAT TGG ATA TCG GCC GGC CAC GCG ATC GCT GAC GTC GGT ACC CTC GAG TCT GGT AAA GAA ACC GCT GCT GCG
M  A  D  L  N  W  I  S  A  G  H  A  I  A  D  V  G  T  L  E  S  G  K  E  T  A  A  A
S tag
AAA TTT GAA CGC CAG CAC ATG GAC TCG TCT ACT AGC GCA GCT TAA TTA ACC TAG GCT ---
K  F  E  R  Q  H  M  D  S  S  T  S  A  A  Stop
    
```

pETDuet-1



```

T7 promoter          lac operator          Xba I          rbs          Nde I          His tag
--- TAA TAC GAC TCA CTA TAG GGG AAT TGT GAG CGG ATA ACA ATT CCC CTC TAG AAA TAA TTT TGT TTA ACT TTA AGA AGG AGA TAT ACC ATG GGC AGC AGC CAT CAC
                                     M G S S H H

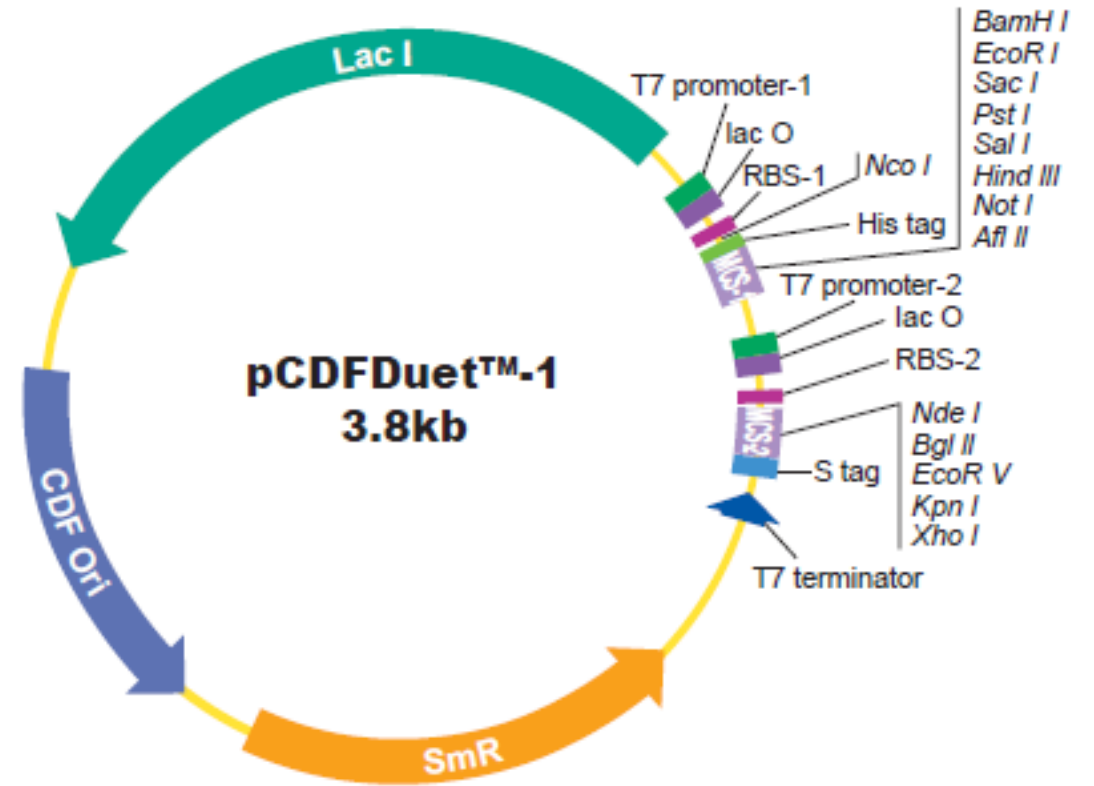
His tag          BamH I  EcoR I  Sac I          Pst I  Sal I  Hind III  Not I
CAT CAT CAC CAC AGC CAG GAT CCG AAT TCG AGC TCG GCG CGC CTG CAG GTC GAC AAG CTT GCG GCC GCA TAA TGC TTA AGT CGA ACA GAA AGT AAT CGT ATT GTA C
H H H H S Q D P N S S S A R L Q V D K L A A A Stop

T7 promoter          lac operator          rbs          Nde I
ACG GCC GCA TAA TCG AAA TTA ATA CGA CTC ACT ATA GGG GAA TTG TGA GCG GAT AAC AAT TCC CCA TCT TAG TAT ATT AGT TAA GTA TAA GAA GGA GAT ATA CAT ATG
M

Bgl II          EcoR V          Kpn I  Xho I          S tag
GCA GAT CTC AAT TGG ATA TCG GCC GGC CAC GCG ATC GCT GAC GTC GGT ACC CTC GAG TCT GGT AAA GAA ACC GCT GCT GCG AAA TTT GAA CGC CAG CAC ATG GAC TCG
A D L N W I S A G H A I A D V G T L E S G K E T A A A K F E R Q H M D S

Bsp I          T7 terminator
TCT ACT AGC GCA GCT TAA TTA ACC TAG GCT GCT GCC ACC GCT GAG CAA TAA CTA GCA TAA CCC CTT GCG GCC TCT AAA CGG GTC TTG AGG GGT TTT TTG ---
S T S A A Stop
  
```


pCDFDuet-1



MCS-1 : 3992-172

```

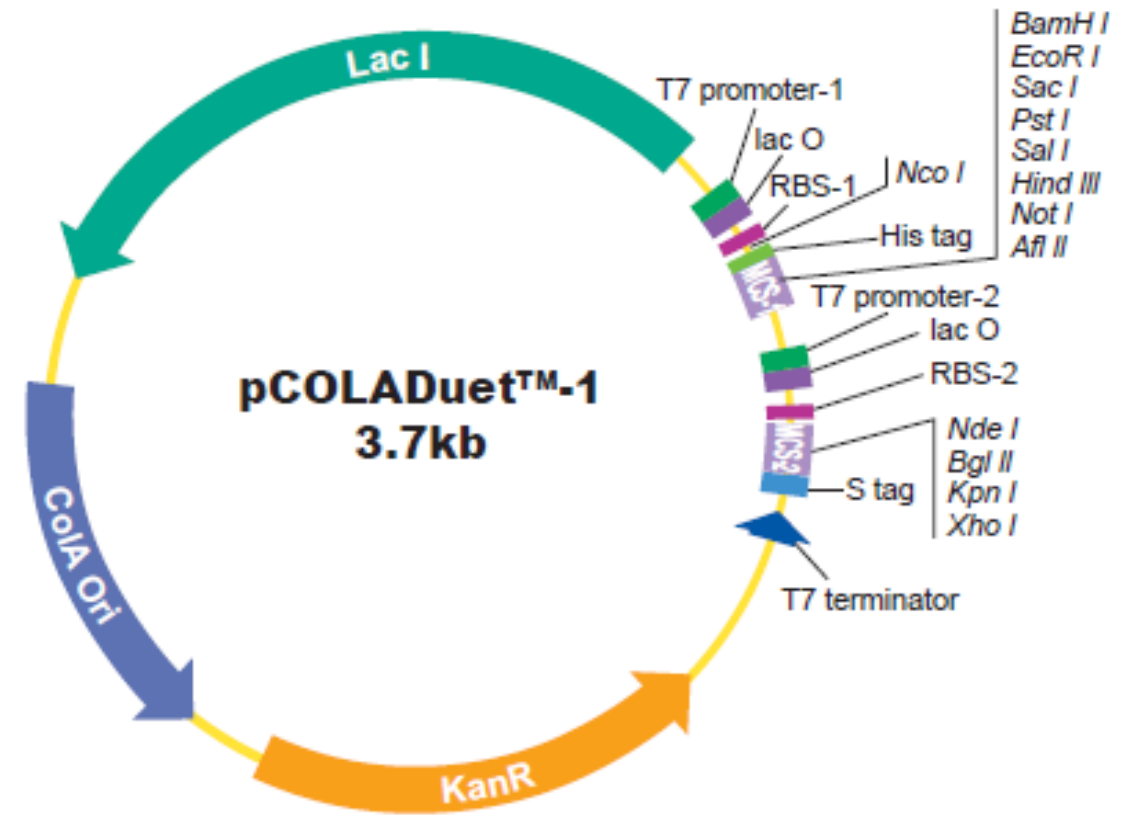
T7 promoter          lac operator          rbs
--- TAA TAC GAC TCA CTA TAG GGG AAT TGT GAG CGG ATA ACA ATT CCC CTG TAG AAA TAA TTT TGT TTA ACT TTA ATA AGG AGA TAT ACC
Nco I              His tag              BamH I  EcoR I  Sac I          Pst I  Sal I  Hind III  Not I
ATG GGC AGC AGC CAT CAC CAT CAT CAC CAC AGC CAG GAT CCG AAT TCG AGC TCG GCG CGC CTG CAG GTC GAC AAG CTT GCG GCC GCA
M  G  S  S  H  H  H  H  H  S  Q  D  P  N  S  S  S  A  R  L  Q  V  D  K  L  A  A  A
Afl II
TAA TGC TTA AGT CGA ---
Stop
    
```

MCS-2: 214-140

```

T7 promoter          lac operator          rbs
--- TA ATA CGA CTC ACT ATA GGG GAA TTG TGA GCG GAT AAC AAT TCC CCA TCT TAG TAT ATT AGT TAA GTA TAA GAA GGA GAT ATA
Nde I      Bgl II      EcoR V          Kpn I  Xho I          S tag
CAT ATG GCA GAT CTC AAT TGG ATA TCG GCC GGC CAC GCG ATC GCT GAC GTC GGT ACC CTC GAG TCT GGT AAA GAA ACC GCT GCT GCG
M  A  D  L  N  W  I  S  A  G  H  A  I  A  D  V  G  T  L  E  S  G  K  E  T  A  A  A
S tag
AAA TTT GAA CGC CAG CAC ATG GAC TCG TCT ACT AGC GCA GCT TAA TTA ACC TAG GCT ---
K  F  E  R  Q  H  M  D  S  S  T  S  A  A  Stop
    
```

pCOLADuet-1



MCS-1 : 3992-172

```

T7 promoter          lac operator          rbs
--- TAA TAC GAC TCA CTA TAG GGG AAT TGT GAG CGG ATA ACA ATT CCC CTG TAG AAA TAA TTT TGT TTA ACT TTA ATA AGG AGA TAT ACC
Nde I              His tag              BamHI   EcoRI   Sac I          Pst I   Sal I   Hind III   Not I
ATG GGC AGC AGC CAT CAC CAT CAT CAC CAC AGC CAG GAT CCG AAT TCG AGC TCG GCG CGC CTG CAG GTC GAC AAG CTT GCG GCC GCA
M  G  S  S  H  H  H  H  H  S  Q  D  P  N  S  S  S  A  R  L  Q  V  D  K  L  A  A  A
Afl II
TAA TGC TTA AGT CGA ---
Stop
    
```

MCS-2: 214-440

```

T7 promoter          lac operator          rbs
--- TA ATA CGA CTC ACT ATA GGG GAA TTG TGA GCG GAT AAC AAT TCC OCA TCT TAG TAT ATT AGT TAA GTA TAA GAA GGA GAT ATA
Nde I      Bgl II          Kpn I   Xho I          S tag
CAT ATG GCA GAT CTC AAT TGG ATA TCG GCC GGC CAC GCG ATC GGT GAC GTC GGT ACC CTC GAG TCT GGT AAA GAA ACC GCT GCT GCG
M  A  D  L  N  W  I  S  A  G  H  A  I  A  D  V  G  T  L  E  S  G  K  E  T  A  A  A
S tag
AAA TTT GAA CGC CAG CAC ATG GAC TCG TCT ACT AGC GCA GCT TAA TTA ACC TAG GCT ---
K  F  E  R  Q  H  M  D  S  S  T  S  A  A  Stop
    
```