



PstI (6)
SdaI (6) **SpeI (13)**
1 CCTGCAGGGCCACTAGTCGCCTTGCTGTGCCACTTTGGGACTTCCCTCCTAGCCTGAGCTTCAGTTTTCTGCCTGTTAGGCAGCCCATGTCAACTG

Eco47III (165)
BamHI (156)
101 CACTTAGTAGGCCGGGTTTGTATGCCCGACAAGACGTGAAGTGGTGGAGGTGGGCAGGATCCCAGCGCTACCATCTTCTTGAACCAAGTATCTCAACACAT

EcoNI (372)
201 CGGATTTCTGTTTCTCATCTGCAAAATGGGATCAGTGAGCTCAGGTGGGTACAAAATTTACAGGAAGTACTTTAGCCAAGCCCGGCCCTGAAAGTT

NaeI (564)
301 CCCCTCGGTGGGCTGTTAGGGTATTGTTTTTCATCTGTGGGGCTCCCTGATGCGTCCCACCCACAGCCTTGGAGAGGGTGGGATGGGAGGGTGGGGTGC

401 TTGGGGAGACAAGCTAGAGCTGGGCCCTCCCACCCACTGCCTCCCCCATCCCAGGGCCCCACCCAGTGACAAAAGCCCGTGGCACTTCTCTACC

Tth111I (781)
501 CGGTTGGCAGGGCGCTGGCCAGCCCTTCTCTAAGGAAGCGATTTCCTGCCTCCCTGGCCGGCCGGGCTGGATGAGCCGGGAGCTCCCTGCTGCCG

601 GTCATACCACAGCCTTCTATGCGCCCTGGGGCCAGGACTGCTGCTGCTACTGCCATCCATTGGAGCCAGCACCCCTCCCGCCATCTTCGGACAG

SandI (808) **NaeI (831)** **BbrPI (897)**
701 CAACTCCAGCCAGCCCGCGTCCCTGTGTCCACTTCTCTGACCCTCGGCCGCCACCCAGAAGGCTGGAGCAGGGACGCCGTCGCTCCGCCGCTG

801 CTCCCCTCGGGTCCCGTGGCAGCCACGCCGGCCCGGTGCCGCCCGCAGCCCTGCCACTGGACACAGGATAAGGCCAGCGCACAGGCCCCACGTTG

NcoI (905) **NheI (943)** **Acc65I (999)**
901 GACACCATGGGGGTTCTCATCATCATCATCATCATGGTATGGCTAGCATGACTGGTGGACAGCAAATGGGTCGGATCTGTACGACGATGACGATAAGG

1001 TACCTAAGGATCAGCTTGGAGTTGATCCCGTCGTTTTACAACGTCGTGACTGGGAAAACCTGGCGTTACCCAACCTAATCGCCTTGACGACATCCCC

32 al ProLysAspGlnLeuGlyValAspProValValLeuGlnArgArgAspTrpGluAsnProGlyValThrGlnLeuAsnArgLeuAlaAlaHisSPProP

FspI (1159)
1101 TTTCCGCGCTGGCGTAATAGCGAAGAGGCCCGCACCGATCGCCCTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGCTTTGCCTGGTTTCCGGCA

65 oPheAlaSerTrpArgAsnSerGluGluAlaArgThrAspArgProSerGlnGlnLeuArgSerLeuAsnGlyGluTrpArgPheAlaTrpPheProAla

Bsu36I (1241)
1201 CCAGAAGCGGTGCCGAAAGCTGGCTGGAGTGCATCTTCTGAGGCCGATACTGTCTGCTGCCCTCAAAGTGGCAGATGCACGGTTACGATGCGCCCA

99 ProGluAlaValProGluSerTrpLeuGluCysAspLeuProGluAlaAspThrValValValProSerAsnTrpGluMetHisGlyTyrAspAlaProI

1301 TCTACCAACGTAACCTATCCATTACGGTCAATCCGCCGTTTGTCCACGGAGAATCCGACGGGTTGTTACTCGCTCACATTTAATGTTGATGAAAG

132 IeTyrThrAsnValThrTyrProIeThrValAsnProPheValProThrGluTyrGlyCysTyrSerLeuThrPheAsnValAspGluSe

1401 CTGGCTACAGGAAGGCCAGCGGAATATTTTTGATGGCGTTAACTCGCGTTCATCTGTGGTGCAACGGCCGCTGGGTCGGTTACGGCCAGGACAGT

165 rTrpLeuGlnGluGlyNThrArgIleIePheAspGlyValAsnSerAlaPheHisLeuTrpCysAsnGlyArgTrpValGlyTyrGlyGluNAspSer

1501 CGTTTGGCTGCTGAATTTGACCTGAGCGCATTTTTACGCGCCGAGAAAACCCCTCGCGGTGATGGTCTGCTTGGAGTGACGGCAGTTATCTGGAAG

199 ArgLeuProSerGluPheAspLeuSerAlaPheLeuArgAlaGlyGluAsnArgLeuAlaValMetValLeuArgTrpSerAspGlySerTyrLeuGluAla

AatII (1640)
1601 ATCAGGATATGTGGCGGATGAGCGGCATTTCCGTGACGTCTCGTTGCTGCATAAACCGACTACACAAATCAGCGATTTCCATGTTGCCACTCGCTTAA

232 spGluNAspMetTrpArgMetSerGlyIlePheArgAspValSerLeuLeuHisLysProThrThrGlnIleSerAspPheHisValAlaThrArgPheAs

1701 TGATGATTTACGCGCGCTGACTGGAGGCTGAAGTTCAGATGTGCGCGAGTTGCGTACTACTACGGTAACAGTTTCTTTATGGCAGGGTGAACCG

265 nAspAspPheSerArgAlaValLeuGluAlaGluValGlnMetCysGlyGluLeuArgAspTyrLeuArgValThrValSerLeuTrpGluNlyGluThr

ClaI (1841)
1801 CAGGTCGCCAGCGCCACCGCCTTTCCGGCGTGAATATCGATGAGCGTGGTGGTTATGCCGATCGCGTCACACTACGCTGAACGTCGAAAACCCGA

299 GluValAlaSerGlyThrAlaProPheGlyGlyGluIleIleAspGluArgGlyGlyTyrAlaAspArgValThrLeuArgLeuAsnValGluAsnProL

1901 AACTGTGGAGCGCGAAATCCCGAATCTCTATCGTGGCGTGGTTGAATGCACACCGCCGACGGCAGCGCTGATTGAAGCAGAAGCCTGCGATGTCGGTTT

332 yssLeuTrpSerAlaGluIleProAsnLeuTyrArgAlaValAlaGluLeuHisThrAlaAspGlyThrLeuIleGluAlaGluAlaCysAspValGlyPh

2001 CCGCGAGTGGCGATTGAAAATGGTCTGCTGCTGAACGGCAAGCCGTTGCTGATTCGAGCGCTTAACCGTCACGAGCATCATCCTGATGGTCAG

365 eArgGluValArgIleGluAsnGlyLeuLeuLeuLeuAsnGlyLysProLeuLeuIleArgGlyValAsnArgHisGluHisHisSPProLeuHisGlyGluN

EcoRV (2130)
2101 GTCATGGATGAGCAGACGATGGTGCAGGATATCCTGCTGATGAAGCAGAACAACCTTAACGCCGTGCGCTGTTTCGATTATCCGAACCATCCGCTGTGGT

399 ValMetAspGluGlnThrMetValGlnAspIleLeuLeuMetLysGlnAsnAsnPheAsnAlaValArgCysSerHisSyrProAsnHisSPProLeuTrpT

SspI (2247)
2201 ACACGCTGTGCGACCGCTACGGCCTGTATGTGGTGGATGAAGCCAATATTGAAACCCACGGCATGGTGCATGAATCGTCTGACCGATGATCCGCGCTG

432 yrThrLeuCysAspArgTyrGlyLeuTyrValValAspGluAlaAsnIleGluThrHisGlyMetValProMetAsnArgLeuThrAspAspProArgTr

BsaBI (2343)
2301 GCTACCGCGATGAGCGAACCGTAACCGAATGGTGCAGCGCATCGTAATCACCCGAGTGTGATCATCTGGTCTGGGGAATGAATCAGGCCACGGC

465 pLeuProAlaMetSerGluArgValThrArgMetValGlnArgAspArgAsnHisSPProSerValIleIleTrpSerLeuGlyAsnGluSerGlyHisGly

2401 GCTAATCACGACGCGCTGTATCGCTGGATCAAATCTGTCGATCCTTCCGCCCGTGCAGTATGAAGCGGGGAGCCGACACCAGGCCACCGATATTA

499 AlaAsnHisAspAlaLeuTyrArgTrpIleLysSerValAspProSerArgProValGlnTyrGluGlyGlyAlaAspThrThrAlaThrAspIleI

BssHIII (2515) **BbsI (2534)**
2501 TTTGCCCGATGTACGCGCGCTGGATGAAGACCAAGCCCTTCCCGCTGTGCCGAAATGGTCCATCAAAAAATGGCTTTCGCTACTGGAGAGACGCGCC

532 IeCysProMetTyrAlaArgValAspGluAspGluNProPheProAlaValProLysTrpSerIleLysLysTrpLeuSerLeuProGlyGluThrArgPr

2601 GCTGATCCTTGGCAATACGCCACGCGATGGGTAACAGTCTTGGCGGTTTCGCTAAACTGCGCAGGCGCTTTCGTCAGTATCCCGTTTACAGGGCGGC

565 oLeuIleLeuCysGluTyrAlaHisAlaMetGlyAsnSerLeuGlyGlyPheAlaLysTyrTrpGluAlaPheArgGluNTrpProArgLeuGluNlyGly

2701 TTCGTCGGGACTGGGTGGATCAGTCGCTGATTAATATGATGAAAACGGCAACCCGTGGTGGCTTACGGCGGTGATTTGGCGATACGCCAACGATC

599 PheValTrpAspTrpValAspGlnSerLeuIleLysTyrAspGluAsnGlyAsnProTrpSerAlaTyrGlyGlyAspPheGlyAspThrProAsnAspA

Eco47III (2852)

2801 GCCAGTTCGTATGAACGGTCTGGTCTTTGCCGACCGCACGCCGATCCAGCGCTGACGGAAGCAAACACCAGCAGCAGTTCCTCCAGTTCCTGTTATC
632▶ r g l n P h e C y s M e t A s n G l y L e u V a l P h e A l a A s p A r g T h r P r o H i s P r o A l a L e u T h r G l u A l a L y s H i s G l n G l n G l n P h e P h e G l n P h e A r g L e u S e
2901 CGGGCAAACCATCGAAGTGACCAGCGAATACCTGTTCCGTCATAGCGATAACGAGCTCCTGCACTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGC
665▶ r G l y G l n T h r I l e G l u V a l T h r S e r G l u T y r L e u P h e A r g H i s S e r A s p A s n G l u L e u L e u H i s T r p M e t V a l A l a L e u A s p G l y L y s P r o L e u A l a S e r
3001 GGTGAAGTGCCTCTGGATGTCGCTCCACAAGGTAACAGTTGATTGAACTGCCTGAACTACCGCAGCCGGAGAGCGCCGGCAACTCTGGCTCACAGTAC
699▶ G l y G l u V a l P r o L e u A s p V a l A l a P r o G l n G l y L y s G l n L e u I l e G l u L e u P r o G l u L e u P r o G l n P r o G l u S e r A l a G l y G l n L e u T r p L e u T h r V a l A
3101 GCGTAGTGAACCGAACCGACCGCATGGTCAGAAAGCCGGGCACATCAGCGCCTGGCAGCAGTGGCGTCTGGCGGAAAACCTCAGTGTGACGCTCCCCGC
732▶ r g V a l V a l G l n P r o A s n A l a T h r A l a T r p S e r G l u A l a G l y H i s I l e S e r A l a T r p G l n G l n T r p A r g L e u A l a G l u A s n L e u S e r V a l T h r L e u P r o A l
3201 CGGTCCCACGCCATCCCGCATCTGACCACAGCGAAATGGATTTTGCATCGAGCTGGGTAATAAGCGTTGGCAATTTAAACCGCAGTCAGGCTTTCTT
765▶ a A l a S e r H i s A l a I l e P r o H i s L e u T h r T h r S e r G l u M e t A s p P h e C y s I l e G l u L e u G l y A s n L y s A r g T r p G l n P h e A s n A r g G l n S e r G l y P h e L e u
3301 TCACAGATGTGGATTGGCGATAAAAAACAACCTGCTGACGCCGCTGCGCGATCAGTTCACCCGTGCACCCTGGATAACGACATTTGGCGTAAGTGAAGCGA
799▶ S e r G l n M e t T r p I l e G l y A s p L y s L y s G l n L e u L e u T h r P r o L e u A r g A s p G l n P h e T h r A r g A l a P r o L e u A s p A s n A s p I l e G l y V a l S e r G l u A l a T
3401 CCCGATTGACCTAACCGCTGGTCTGAACGCTGGAAGCGCGGGCCATTACCAGGCCAAGCAGCGTTGTTGCACTGCACGGCAGATACACTTGTCTGA
832▶ h r A r g I l e A s p P r o A s n A l a T r p V a l G l u A r g T r p L y s A l a A l a G l y H i s T y r G l n A l a G l u A l a L e u L e u G l n C y s T h r A l a A s p T h r L e u A l a A s
3501 TGCGGTGCTGATTACGACCGCTCAGCGTGGCAGCATCAGGGGAAAACCTTATTTATCAGCCGAAAACCTACCGGATTGATGGTAGTGGTCAAATGGCG
865▶ p A l a V a l L e u I l e T h r T h r A l a H i s A l a T r p G l n H i s G l n G l y L y s T h r L e u P h e I l e S e r A r g L y s T h r T y r A r g I l e A s p G l y S e r G l y G l n M e t A l a
3601 ATTACCGTTGATGTTGAAGTGGCGAGCGATACCCGCATCCGCGCGGATTGGCTGAACTGCCAGCTGGCGCAGGTAGCAGAGCGGGTAAACTGGCTCG
899▶ I l e T h r V a l A s p V a l G l u V a l A l a S e r A s p T h r P r o H i s P r o A l a A r g I l e G l y L e u A s n C y s G l n L e u A l a G l n V a l A l a G l u A r g V a l A s n T r p L e u G

BbsI (3786)

Bst1107I (3779)

BspLU11I (3776) BsiWI (3787)

3701 GATTAGGGCCGAAGAAAATATCCCGACCGCCTTACTGCCGCTGTTTTGACCGCTGGGATCTGCCATTGTCCAGACATGTATACCCCGTACGCTTCCC
932▶ l y L e u G l y P r o G l n G l u A s n T y r P r o A s p A r g L e u T h r A l a A l a C y s P h e A s p A r g T r p A s p L e u P r o L e u S e r A s p M e t T y r T h r P r o T y r V a l P h e P r
3801 GAGCGAAAACGGTCTGCGCTGCGGGACGCGCAATTGAATTATGGCCACACCAGTGGCGCGGCGACTTCCAGTTCAACATCAGCCGCTACAGTCAACAG
965▶ o S e r G l u A s n G l y L e u A r g C y s G l y T h r A r g G l u L e u A s n T y r G l y P r o H i s G l n T r p A r g G l y A s p P h e G l n P h e A s n I l e S e r A r g T y r S e r G l n G l n

NdeI (3974)

3901 CAACTGATGGAACACAGCCATCGCCATCTGCTGACCGGGAAGAGGCACATGGCTGAATATCGACGGTTTCCATATGGGGATTGGTGGCGACGACTCCT
999▶ G l n L e u M e t G l u T h r S e r H i s A r g H i s L e u L e u H i s A l a G l u G l u G l y T h r T r p L e u A s n I l e A s p G l y P h e H i s M e t G l y I l e G l y G l y A s p A s p S e r T

NheI (4096)

EcoRI (4090)

4001 GGAGCCCGTCAGTATCGGCGGAATTACAGCTGAGCGCCGGTCTGCTACCATTACAGTTGGTCTGGTGTCAAAAATAATAATCTAGTCGAGAATTCGCTAG
1032▶ r p S e r P r o S e r V a l S e r A l a G l u L e u G l n L e u S e r A l a G l y A r g T y r H i s T y r G l n L e u V a l T r p C y s G l n L y s ●●●
4101 CTCGACATGATAAGATACATTGATGAGTTTGGACAAACCAACTAGAATGCAGTGAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTAT

MfeI (4270)

4201 TTGTGAAATTTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAAACAAGTTAACAAACAATTGCATTCATTTATGTTTCAGGTTTCAG

DraI (4319)

DraI (4358)

SwaI (4361)

4301 GGGGAGGTGTGGGAGTTTTTTAAAGCAAGTAAAACCTCTACAAATGTGGTAGATCCATTTAAATGTTAATTAAGTAACTAGCCATGACCAAAATCCCTTAACG

4401 TGAGTTTTCTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAAACAAA

4501 AAACCACCGCTACCAGCGGTGGTTTGTGGCCGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAAGTGGCTTCAGCAGAGCGCAGATACCAAACTAG

4601 TTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTCAAGAACTCTGTAGCACCCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAG

4701 TGGCGATAAGTCTGTCTTACCAGGTTGGACTCAAGACGATAGTTACCAGATAAGGCGCAGCGGTCGGGCTGAACGGGGGTTCTGTGCACACAGCCAGC

4801 TTGGAGCGAACGACCTACCCGAAGTGAATACCTACAGCGTGAAGCTATGAGAAAGCGCCACGCTTCCGAAGGGAGAAAGCGGACAGGTATCCGGTAA

4901 CGGCAGGGTCGGAACAGGAGAGCGCAGGGAGCTTCCAGGGGAAACGCCTGGTATCTTTATAGTCTGTGCGGTTTCGCCACCTCTGACTTGAGCG

BspLU11I

5001 TCGATTTTTGTGATGCTCGTCAGGGGGCGGAGCCTATGGAACACGCCAGCAACCGGCCTTTTTACGGTTCCTGGCCTTTTGTGGCCTTTTGTCTAC

AseI (5137)

SfiI (5188)

MseI (5199)

5101 ATGTTCTTAATTAATTTTTCAAAGTAGTTGACAATTAATCATCGGCATAGTATATCGGCATAGTATAATACGACTCACTATAGGAGGGCCATCATGG

1▶ MetA

5200 CCAAGTTGACCAAGTGTGCTCCAGTGTCTCACAGCCAGGGATGTGGCTGGAGCTGTTGAGTCTGGACTGACAGGTTGGGGTCTCCAGAGATTTTGTGGG

5300 GGATGACTTTGCAGGTGTGGTCTCAGAGATGATGTACCCCTGTTTCATCTCAGCAGTCCAGGACAGGTGGTGCCTGACAACACCCCTGGCTGGGTGGGTG

5400 AGAGGACTGGATGAGCTGTATGCTGAGTGGAGTGGTGGTCTCCACCAACTTCAGGGATGCCAGTGGCCCTGCCATGACAGAGATTGGAGAGCAGCCCT

5500 GGGGGAGAGAGTTTGCCTGAGAGACCCAGCAGGCAACTGTGTGCACTTTGTGGCAGAGGAGCAGGACTGAGGATAAGAAATTGAGTTTCAGAAAAGGGGG

SfiI (5597)

5600 CCTGAGTGGCCCTTTTTTCAACTTAATTAA