



PstI (6)

SdaI (6)

1 CCTGCAGGGCCACTAGTCTTTTGAAGCAGTGCAGGGGGTCTAGGTGTGGCAGGGACGAGCTGGCGCGCGTCTGGTGCACCCGGACCACGGGC

101 AGAGCCACGGCGGGGAGGACTACAACCTCCGGCACACCCCGCGCCGCCCTCTACTCCAGAAGCCGGGGGGTGGACCCCTAAGAGGGCGTG

BspHI (283)

201 CGCTCCCACATGCCCCGGCGGCCATTAACCCGACGATTTGAATCGCCGGACCCGTTGGCAGAGTGGCGCGCGGCATCATGAGCGGTCTCATC

1▶MetSerGlySerHisH

Bsu36I (382)

NheI (321)

Acc65I (377)

301 ATCATCATCATGGTATGGCTAGCATGACTGGTGGACAGCAAATGGTCTGGGATCTGTACGACGATGACGATAAGGTACCTAAGGATCAGCTTGGAGT

6▶iShiShiShiShiSGLyMetAlaSerMetThrGlyGlyNGLyMethGlyArgAspLeuTyrAspAspAspLysValProLysAspGlnLeuGlyVa

401 TGATCCCGTCTTTTACAACGCTGCTGACTGGGAAAACCTGGCGTTACCAACTTAATCGCCTTGACGACATCCCCCTTCCGACGCTGGCGTAATAGC

39▶IAspProValValLeuGlnArgArgAspTrpGlyuAsnProGlyValThrGlnLeuAsnArgLeuAlaAlaHisSPProPheAlaSerTrpArgAsnSer

501 GAAGAGCGCCGACCGATCCCTTCCCAACAGCTTCCGACGCTGAATGGCGAATGGCGCTTTCCTGGTTCCCGCACGAAAGCGGCGGAAAGCT

73▶GluGluAlaArgThrAspArgProSerGlnGlnLeuArgSerLeuAsnGlyGluTrpArgPheAlaTrpPheProAlaProGluAlaValProGluSerT

Bsu36I (619)

601 GGCTGGAGTGCATCTTCTGAGCCGATACTGCTGCTGCCCTCAAACCTGGCAGATGCACGGTACGATGCGCCATCTACACCAACGTAACCTATCC

106▶rPLeuGluCysAspLeuProGluAlaAspThrValValValProSerAsnTrpGlnMethHisSGLyTyrAspAlaProIleTyrThrAsnValThrTyrP

701 CATTACGGTCAATCCGCGTTTGTCCACGGAGAATCCGACGGGTTTACTCGCTCACATTTAATGTTGATGAAAGCTGGCTACAGGAAGCCAGACG

139▶olIleThrValAsnProProPheValProThrGluAsnProThrGlyCysTyrSerLeuThrPheAsnValAspGluSerTrpLeuGlnGlyGlyNThr

801 CGAATATTTTTGATGGCGTTAACTCGGCGTTTCATCTGTGTGCAACGGCGCTGGGTCGGTACGGCCAGGACAGTCGTTTCCGCTGAATTTGACC

173▶ArgIleIlePheAspGlyValAsnSerAlaPheHisValLeuTrpCysAsnGlyArgTrpValGlyTyrGlyGlnAspSerArgLeuProSerGluPheAspL

901 TGAGCGCATTTTTACGCGCCGAGAAAACCGCTCGCGGTGATGGTGTGCGTTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGATGAG

206▶euSerAlaPheLeuArgAlaGlyGlyuAsnArgLeuAlaValMetValLeuArgTrpSerAspGlySerTyrLeuGluAspGlnAspMetTrpArgMetSe

239▶rGlyIlePheArgAspValSerLeuLeuHisLysProThrThrGlnIleSerAspPheHisValAlaThrArgPheAsnAspSerAspAlaVal

1101 CTGGAGGCTGAAGTTCAGATGTGCGCGAGTTCGCTGACTACCTACGGTAAACAGTTTCTTTATGGCAGGGTAAACGCGAGTTCGCGAGCCGACCGCGC

273▶LeuGluAlaGluValGlnMetCysGlyGluLeuArgAspTyrLeuArgValThrValSerLeuTrpGlnGlyGluThrGlnValAlaSerGlyThrAlaP

ClaI (1219)

1201 CTTTCGGCGTGAATATCGATGAGCGTGGTGTATGCGGATCGCGTCACTACGCTCTGAACGTCGAAAACCCGAAACTGTGGAGCGCGAAATCCC

306▶roPheGlyGlyGluIleIleAspGluArgGlyGlyTyrAlaAspArgValThrLeuArgLeuAsnValGluAsnProLysLeuTrpSerAlaGluIleP

1301 GAATCTCTATCGTGGTGGTGAACCTGCACACCGCGACGGCAGCTGATTGAAGCAGAAGCCCTGCGATGTCGGTTCGCGAGGTGGCGATTGAAAAT

339▶oAsnLeuTyrArgAlaValValGluLeuHisThrAlaAspGlyThrLeuIleGluAlaGluAlaCysAspValGlyPheArgGluValArgIleGluAsn

1401 GGTCTGCTGCTGAACGGCAAGCCGTTGCTGATTCGAGGCGTAAACGTCACGAGCATCATCTCTGCATGGTCAGGTCATGGATGAGCAGACGATGG

373▶GlyLeuLeuLeuLeuLeuLysProLeuLeuIleArgGlyValAsnArgHisSGLyHisSIProLeuHisSGLyGlnValMetAspGluGlnThrMetV

EcoRV (1508)

1501 TGCAGGATATCTGCTGATGAAGCAGAACAACCTTTAACCGCGTCCGCTTCCGATATCCGAACCATCCGCTGTGGTACACGCTGTGCGACCGCTACGG

406▶alGlnAspIleLeuLeuMetLysGlnAsnAsnPheAsnAlaValArgCysSerHisTyrProLeuTrpThrGlyLeuCysAspArgTyrGly

1601 CCTGTATGTGGTGAATGAAGCAATATTGAAACCCACGGCATGGTGGCAATGAATCGTCTGACCGATGATCCGCGTGGCTACCGCGATGAGCGAACGC

439▶yLeuTyrValValAspGluAlaAsnIleGluThrHisSGLyMetValProMetAsnArgLeuThrAspAspProArgTrpLeuProAlaMetSerGluArg

1701 GTAACCGAATGGTGCAGCGCATCTGAATCACCGAGTGATCATCTGGTCTGGGAAATGAATCAGGCCACGGCGCTAATCAGACGCGCTGTATC

473▶ValThrArgMetValGlnArgAspArgAsnHisSProSerValIleIleTrpSerLeuGlyAsnGluSerGlyHisSGLyAlaAsnHisAspAlaLeuTyrA

1801 GCTGGATCAAATCTGATCTTCCGCGCGTTCAGTATGAAGCGGGGAGCGGACACCACCGCCACCGATATTTCGCGCATGATACGCGCGCT

506▶rGTrpIleLysSerValAspProSerArgProValGlnTyrGluGlyGlyAlaAspThrThrAlaThrAspIleIleCysProMetTyrAlaArgVa

1901 GGATGAAGACAGCCCTCCCGCTGTGCCAAATGGTCCATCAAAAATGGCTTTCGCTACCTGGAGAGACGCGCCCGCTGATCTTTCGCAATACGCC

539▶IAspGluAspGlnProPheProAlaValProLysTrpSerIleLysLysTrpSerLeuProAspGlyGluThrArgProGluIleLeuCysGluTyrAla

2001 CACGCGATGGTAACAGTCTTGGCGGTTTCGCTAAATCTGCGAAGCAACACCGAGCAGCAGTTCCTTTCAGTTCGTTTACAGGGCGGCTTCTGCTGGGATGGT

573▶HisAlaMetGlyAsnSerLeuGlyGlyPheAlaLysTyrTrpGlnAlaPheArgGlnTyrProArgLeuGlnGlyGlyPheValTrpAspTrpValAspG

2101 AGTCGCTGATTAATATGATGAAAACGGCAACCCGTTGGTGGCTTACGGCGGTTGATTTTGGCGATACGCCAAGCATGCCAGTTCGTATGAACGGTCT

606▶InSerLeuIleLysTyrAspGluAsnGlyAsnProPheSerAlaTyrGlyGlyAspPheGlyAspThrProAsnAspArgGlnPheCysMetAsnGlyLe

2201 GGTCTTTGCCGACCGCGCATCCAGCGCTGACGCGAAGCAACACCGAGCAGCAGTTCCTTTCAGTTCGTTTACAGGGCGGCTTCTGCTGGGATGGT

639▶uValPheAlaAspArgThrProHisSProAlaLeuThrGluAlaLysHisSGLyGlnGlnPhePheGlnPheArgLeuSerGlyGlnThrIleGluValThr

2301 AGCGAATACCTGTTCCGTCATAGCGATAACGAGCTCTGCACTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCCTCGGATGTCG

673▶SerGluTyrPheArgHisSerAspAsnGluLeuLeuHisTyrPheMetValAlaLeuAspGlyLysProLeuAlaSerGlyGluValProLeuAspValA

2401 CTCACAAGGTAACAGTGTGATGAACCTGCACTACCGCAGCCGAGCGGCGCAACTCTGGCTCACAGTACGCGTGAAGTCAACAGCAACTGAGCCGAC

706▶IaProGlnGlyLysGlnLeuIleGluLeuPProGluLeuProGluNProGluSerAlaGlyGlnLeuTrpLeuThrValArgValValGlnProAsnAlaTh

2501 CGCATGGTCAGAAGCGGGCACATCAGCGCTGGCAGCAGTGGCGTCTGGCGGAAAACCTCAGTGTGACGCTCCCGCGCGTCCCACGCCATCCCGCAT

739▶rAlaTrpSerGluAlaGlyHisIleSerAlaTrpGlnGlnTrpArgLeuAlaGluAsnLeuSerValThrLeuProAlaAlaSerHisAlaIleProHis

2601 CTGACCACCGCAATGGATTTTGCATCGAGTGGGTAATAGCGTTGGCAATTTAACCGCCAGTCAGGCTTCTTTCCAGATGTGGATTTGGCGATA

773▶LeuThrThrSerGluMetAspPheCysIleGluLeuGlyAsnLysArgTrpGlnPheAsnArgGlnSerGlyPheLeuSerGlnMetTrpIleGlyAspL

2701 AAAAACAACCTGCTGACGCGCTGCGGATCAGTTACCCGTCACCGCTGGATAACGACATTGGCGTAAGTGAAGCGACCCGATTGACCTAACCGCTG

806▶ysLysGlnLeuLeuThrProLeuArgAspGlnPheThrArgAlaProLeuAspAsnAspIleGlyValSerGluAlaThrArgIleAspProAsnAlaTr

2801 GGTGAAACGCTGAAGCGGGCGGCGCATTACAGGCGAAGCAGCGTGTGGTGGTGGTGGTGGTGGTGGTGGTGGTGGTGGTGGTGGTGGTGGTGGT

839▶pValGluArgTrpLysAlaAlaGlyHisTyrGlnAlaGluAlaAlaLeuLeuGlnCysThrAlaAspThrLeuAlaAspAlaValLeuIleValThrAla

2901 CACGCGTGGCAGCATCAGGGAAAACCTTATTTATCAGCCGAAAACCTACCGGATGATGGTGGTGGTGGTGGTGGTGGTGGTGGTGGTGGTGGTGGT

873▶HisAlaTrpGlnHisSGLyLysThrLeuPheIleSerArgLysThrTyrArgIleAspGlySerGlyGlnMetAlaIleThrValAspValGluValA

3001 CGAGCGATACCCGATCCGCGCGGATTGGCTGAACTGCCAGCTGGCGAGTAGCAGAGCGGGTAAACTGGCTGGATAGGGCCGCAAGAAAACCTA

906▶IaSerAspThrProHisSProAlaArgIleGlyLeuAsnCysGlnLeuAlaAlaGluValAlaGluArgValAsnTrpLeuGlyLeuGlyProGlnGluAsnTy

BspLU11I (3154)

3101 TCCCAGCCGCTTACTGCCGCTGTTTTGACCCTGGGATCTGCCATTTGTCAGACATGTATACCCGCTACGCTTCCCAGCGAAAACGGTCTGCGCTGC

939▶rProAspArgLeuThrAlaAlaCysPheAspArgTrpAspLeuProLeuSerAspMetTyrThrProTyrValPheProSerGluAsnGlyLeuArgCys

3201 GGGACCGCGAATGAATATGCCCACACCGAGTGGCGGGCGACTCCAGTTCAACATCAGCCGCTACAGTCAACAGCAACTGATGGAAACAGCCATC

973▶GlyThrArgGluLeuAsnTyrGlyProHisSGLyNTrpArgGlyAspPheGlnPheAsnIleSerArgTyrSerGlnGlnGlnLeuMetGluThrSerHisA

3301 GCCATCTGCTGCACGCGAAGAAGGCACATGGCTGAATATCGACGGTTTCATATGGGGATTGGTGGCGACGACTCTGGAGCCGTCAGTATCGGCGGA

1006▶rGHisLeuLeuHisAlaGluGluGlyThrTrpLeuAsnIleAspGlyPheHisSMeTgylleGlyGlyAspAspSerTrpSerProSerValSerAlaGlu

NheI (3474)

EcoRI (3468)

3401 ATTACAGCTGAGCGCCGGTCTGCTACCATTACCAGTTGGTCTGGTGTCAAAAATAATAATCTAGTCGAGAATTCGCTAGCTCGACATGATAAGATAATTG
 1039▶ uLeuGlnLeuSerAl aGlyArgTyrHisTyrGlnLeuVal TrpCysGlnLys●●●
 3501 ATGAGTTTGGACAAACCACAACCTAGAATGCAGTGAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTGAAATTTGTGATGCTATT
 3601 GCTTTATTTGTAACCATTATAAGCTGCAATAAACAAGTTAACAACAACAATTGCATTCATTTTATGTTTCAGGTTTCAGGGGAGGTGTGGGAGGTTTTTT

SwaI (3739)

3701 AAAGCAAGTAAACCTCTACAAATGTGGTAGATCCATTTAAATGTTAATTAAGTACGCGTACGACAAAATCCCTTAACGTGAGTTTTTCGTTCCACTGAGCG
 3801 TCAGACCCCGTAGAAAAAGATCAAGGATCCTTTGAGATCCTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAACACCGCTACCAGCGGTGG
 3901 TTTGTTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAAGTGGCTTCCAGCAGAGCGCAGATACCAAATACTGTTCTTCTAGTGTAGCCGTAGTT
 4001 AGGCCACCACTTCAAGAAGTCTGTAGCACCGCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCTGTCTTACC
 4101 GGGTTGGACTCAAGACGATGTTACCGGATAAGGCGCAGCGGTGGGCTGAACGGGGGTTCTGTCACACAGCCAGCTTGAGCGAACGACCTACACCG
 4201 AACTGAGATACCTACAGCGTGTGCTATGAGAAAGCGCCACGCTTCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGA
 4301 GCGCACGAGGGAGCTTCCAGGGGAAACGCCTGGTATCTTTATAGTCTGTGCGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCA

BspLU11I (4477)

4401 GGGGGCGGAGCCTATGAAAAACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTAATTAATTTTTCA

AseI (4515)

4501 AAAGTAGTTGACAATTAATCATCGGCATAGTATATCGGCATAGTATAATACGACTCACTATAGGAGGGCCATCATGGCCAAGTTGACCAGTGTGTCCCA
 4601 GTGCTCACAGCCAGGGATGTGGCTGGAGCTGTTGAGTTCTGGACTGACAGGTTGGGTTCTCCAGAGATTTGTGGAGGATGACTTGCAGGTGTGGTCA
 10▶ ValLeuThrAl aArgAspValAl aGlyAl aVal Gl uPheTrpThrAspArgLeuGlyPheSerArgAspPheVal Gl uAspAspPheAl aGlyValValA
 4701 GAGATGATGTCACCCTGTCATCTCAGCAGTCCAGGACCGGTTGGCTGCAACACCCTGGCTTGGGTGGGTGAGAGGACTGGATGAGCTGTATGC
 43▶ r gAspAspVal ThrLeuPheIleSerAl aVal Gl nAspGlnVal ValProAspAsnThrLeuAl aTrpValTrpValArgGlyLeuAspGluLeuTyrAl
 4801 TGAGTGGAGTGGTGGTCTCCACCAACTTCAGGGATGCCAGTGGCCCTGCCATGACAGAGATTGGAGAGCAGCCCTGGGGAGAGAGTTGCCCTGAGA
 76▶ aGluTrpSerGluValValSerThrAsnPheArgAspAl aSerGlyProAl aMetThrGluIleGlyGluGlnProTrpGlyArgGluPheAl aLeuArg
 4901 GACCCAGCAGGCAACTGTGTCACTTTGTGGCAGAGGAGCAGGACTGAGGATAAGAATTGAGTTTCAGAAAAGGGGCGCTGAGTGGCCCTTTTTTCAAC
 110▶ AspProAl aGlyAsnCysValHisPheValAl aGluGluGlnAsp●●●
 5001 TTAATTAA