



150

PstI (7)
SdaI (7) **SpeI (14)**

EagI (47)
NotI (47)

1 CCTGCAGGGCCCACTAGTTCGCCAGAGCGCGGAGGGCCCTCCAGCGCGCCCTCCCCACAGCAGGGGGGGTCCCGGCCACCGGAAGGAGCGG

HindIII (199)

101 GCTCGGGGGGGGGCGCTGATTGCCGGGGGGGGCTGACGCCGACGGGCTATAAGAGACCACAAGCGACCCGAGGGCCAGACGTTCTTCGCCAAG

201 CTTTCAGGGGCTCGCATCTCTCCTTCACGGCGCCGGCCCTACCTGAGGCGCCATCCACGCCGTTGAGTCCGGTCTTCCGCCCTCCCGCTGTGGTG

301 CCTCCTGAACTGCGTCCCGCTTAGGTAAGTTAAAGCTCAGGTCGAGACCGGGCCTTTGTCCGGCGCTCCCTTGGAGCCTACCTAGACTCAGCCGGCT

NcoI (484)

401 CTCCACGCTTTGGCTGACCCTGTTGCTCAACTCTACGCTTTTGTTCGTTTCTGTTCTGCGCGCTTACAGATCAAGCCACCATGGGGGTTCTCATC

MetGlyGlySerHisH

NheI (522)

501 ATCATCATCATCATGGTATGGCTAGCATGACTGGTGACAGCAAATGGGTCGGGATCTGTACGACGATGACGATAAGGTACCTAAGGATCAGCTTGGAGT

61 isHisHisHisHisGlyMetAlaSerMetThrGlyGlyGlnGlnMetGlyArgAspLeuTyrAspAspAspLysValProLysAspGlnLeuGlyVa

601 TGATCCCGTCGTTTACACCGTCGTACTGGGAAAACCTGGCGTTACCAACTTAATCGCCTTGCAGCACATCCCCCTTTCGCCAGCTGGCGTAATAGC

39 IAspProValValLeuGlnArgArgAspTrpGluAsnProGlyValThrGlnLeuAsnArgLeuAlaAlaHisProProPheAlaSerTrpArgAsnSer

701 GAAGAGCCCGCACCAGTCCCGCTCCCAACAGTTGCGCAGCTGAATGGCGAATGGCGCTTTCGCTGGTTCCCGCACCAGAAGCGGTCCGGAAAGCT

73 GluGluAlaArgThrAspArgProSerGlnGlnLeuArgSerLeuAsnGlyGluTrpArgPheAlaTrpPheProAlaProGluAlaValProGluSerT

801 GGCTGGAGTGGATCTTCTGAGGCGGATATGTCGTCGCCCTCAAACCTGGCAGATGCACGGTTACGATGCGCCATCTACCAACGTAACCTATCC

106 rLeuGluGluCysAspLeuProGluAlaAspThrValValValProSerAsnTrpGlnMetHisGlyTyrAspAlaProI leTyrThrAsnValThrTyrPr

901 CATTACGGTCAATCCCGCTTGTTCGCCAGGAGAATCCGACGGGTTGTTACTCGCTCACATTAATGTTGATGAAAGCTGGCTACAGGAAGCCAGACG

139 ol leThrValAsnProPheValProThrGluAsnProThrGlyCysTyrSerLeuThrPheAsnValAspGluSerTrpLeuGlnGluGlyGlnThr

1001 CGAATTATTTTGTGAGCGGTTAACTCGCGCTTTCATCTGTTGCAACGGCGCTGGTTCGTTACGGCCAGGACAGTCTTTCGCGTCTGAATTTGACC

173 ArgI leI lePheAspGlyValAsnSerAlaPheHisLeuTrpCysAsnGlyArgTrpValGlyTyrGlyGlnAspSerArgLeuProSerGluPheAspL

1101 TGAGCGCATTTTACGCGCCGAGAAAACCGCTCGCGGTGATGGTGTGCGTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGATGAG

206 euSerAlaPheLeuArgAlaGlyGluAsnArgLeuAlaValMetValLeuArgTrpSerAspGlySerTyrLeuGluAspGlnAspMetTrpArgMetSe

1201 CGGCATTTTCCGTGACGTCCTGTTGCTGCATAAACCGACTACACAAATCAGCGATTTCCATGTTGCCACTCGCTTAAATGATGATTTACGCCGCGCTGTA

239 r GlyI lePheArgAspValSerLeuLeuHisLysProThrThrGlnI leSerAspPheHisValAlaThrArgPheAsnAspAspPheSerArgAlaVal

1301 CTGGAGGCTGAAGTTCAGATGTCGGCGAGTTGCGTGACTACCTACGGGTAACAGTTTCTTTATGGCAGGGTGAACGCAGGTCGCCAGCGCCACCGCC

273 LeuGluAlaGluValGlnMetCysGlyGluLeuArgAspTyrLeuArgValThrValSerLeuTrpGlnGlyGluThrGlnValAlaSerGlyThrAlaP

ClaI (1420)

1401 CTTTCGGCGGTGAAATATCGATGAGCGTGGTGGTTATGCCGATCGCGTACACTACGCTGAAACGTCGAAAACCCGAACTGTGGAGCGCCGAAATCCC

306 roPheGlyGlyGluI leI leAspGluArgGlyGlyTyrAlaAspArgValThrLeuArgLeuAsnValGluAsnProLysLeuTrpSerAlaGluI lePr

1501 GAATCTCTATCGTGGGTGGTGAAGTGCACACCGCCGACGGCAGCGTATTGAAGCAGAAGCCTGCGATGTCGGTTTCCGCGAGGTGGCGATTGAAAAT

339 oAsnLeuTyrArgAlaValGluLeuHisThrAlaAspGlyThrLeuI leGluAlaGluAlaCysAspValGlyPheArgGluValArgI leGluAsn

1601 GGTCTGCTGCTGCTGAACGGCAAGCCGTTGCTGATTTCGAGGCGTTAACCGTACGAGCATCATCCTCTGCATGGTCAGGTCATGGATGACGAGCGATGG

373 GlyLeuLeuLeuLeuAsnGlyLysProLeuLeuI leArgGlyValAsnArgHisGluHisHisProLeuHisGlyGlnValMetAspGluGlnThrMetV

EcoRV (1709)

1701 TGCAGGATACCTGTGATGAAGCAGAACAACCTTAAACCGCTGCGCTGTTCCGATTATCCGAACCATCCGCTGTGGTACACGCTGTGGACCGCTACGG

406 alGlnAspI leLeuLeuMetLysGlnAsnAsnPheAsnAlaValArgCysSerHisTyrProAsnHisProLeuTrpTyrThrLeuCysAspArgTyrGl

1801 CCTGTATGTGGTGGATGAAGCAATATTGAAACCCACGGCATGGTGCCAATGAATCGCTGACCGATGATCCGCGCTGGCTACCGCGATGAGCGAACGC

439 yLeuTyrValValAspGluAlaAsnI leGluThrHisGlyMetValProMetAsnArgLeuThrAspAspProArgTrpLeuProAlaMetSerGluArg

BsaBI (1922)

1901 GTAACCGAATGGTGCAGCGCATCGTAATCACCCGAGTGTGATCATCTGGTCGCTGGGGAATGAATCAGGCCACGGCGCTAATCACGACGCGCTGTATC

473 ValThrArgMetValGlnArgAspArgAsnHisProSerValI leI leTrpSerLeuGlyAsnGluSerGlyHisGlyAlaAsnHisAspAlaLeuTyrA

2001 GCTGGATCAAATCTGTCGATCCTTCCGCCCCGTCAGTATGAAGCGCGGAGCCGACACCAGGCCACCGATATTATTTGCCGATGTACCGCGCGT

506 rgTrpI leLysSerValAspProSerArgProValGlnTyrGluGlyGlyAlaAspThrThrAlaThrAspI leI leCysProMetTyrAlaArgVa

2101 GGATGAAGACCGCCCTTCCGGCTGTGCCAAATGGTCCATCAAAAATGGCTTTCGCTACCTGGAGAGACGGCCCGCTGATCCTTTGCGAATACGCC

539 IAspGluAspGlnProPheProAlaValProLysTrpSerI leLysLysTrpLeuSerLeuProGlyGluThrArgProLeuI leLeuCysGluTyrAla

2201 CACGCGATGGGTAACAGTCTTGGCGGTTTCGCTAAATACTGGCAGGCGTTTCGTCAGTATCCCGGTTACAGGGCGGCTTCGCTGGGACTGGTGGATC

573 HisAlaMetGlyAsnSerLeuGlyGlyPheAlaLysTyrTrpGlnAlaPheArgGlnTyrProArgLeuGlnGlyGlyPheValTrpAspTrpValAspG

2301 AGTCGCTGATTAATATGATGAAAACGGCAACCCGTTGCTGCGCTTACGGCGGTGATTTGGCGATACGCCGAACGATCGCCAGTTCTGTATGAACCGTCT

606 InSerLeuI leLysTyrAspGluAsnGlyAsnProTrpSerAlaTyrGlyGlyAspPheGlyAspThrProAsnAspArgGlnPheCysMetAsnGlyLe

Eco47III (2431)

2401 GGTCTTTGCCACCGCAGCCGATCCAGCGCTGACGGAAGCAAACACCAGCAGCAGTTTTTCCAGTTCGGTTATCCGGGCAAACCATCGAAGTGACC

639 uValPheAlaAspArgThrProHisProAlaLeuThrGluAlaLysHisGlnGlnGlnPhePheGlnPheArgLeuSerGlyGlnThrl leGluValThr

SacI (2536)

2501 AGCGAATACCTGTTCCGTCATAGCGATAACGAGCTCCTGCACTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTCCCTCTGGATGTCG

673 SerGluTyrLeuPheArgHisSerAspAsnGluLeuLeuHisTrpMetValAlaLeuAspGlyLysProLeuAlaSerGlyGluValProLeuAspValA

2601 CTCCACAAGGTAACAGTTGATTGAACTGCCTGAACTACCGCAGCCGAGAGCCGGGCAACTCTGGCTCACAGTACCGGTAGTCAACCGAAGCCGAC

706 IaProGlnGlyLysGlnLeuI leGluLeuProGluLeuProGlnProGluSerAlaGlyGlnLeuTrpLeuThrValArgValValGlnProAsnAlaTh

2701 CGCATGGTCAGAAGCCGGCACATCAGCGCTGGCAGCAGTGGCGTCTGGCGAAAACCTCAGTGTGACGCTCCCGCGCGTCCACGCCATCCCGCAT

739 rAlaTrpSerGluAlaGlyHisI leSerAlaTrpGlnTrpArgI leLysLeuSerLeuProGlyGluThrArgLeuAlaSerHisAlaI leProHis

2801 CTGACCACCGCAATGGATTTTGCATCGAGCTGGGTAATAAGCGTTGGCAATTTAACCGCCAGTCAGGCTTCTTTACAGATGTTGGATTGGCGATA

773 LeuThrThrSerGluMetAspPheCysI leGluLeuGlyAsnLysArgTrpGlnPheAsnArgGlnSerGlyPheLeuSerGlnMetTrpI leGlyAspL

2901 AAAAAAAGTGTGACCGCGCTGCGCGATCAGTTTACCCGTCACCGCTGGATAACGACATTTGGCGTAAGTGAAGCGACCCGATTGACCTAACCGCTG

806 ysLysGlnLeuThrProLeuArgAspGlnPheThrArgAlaProLeuAspAsnAspI leGlyValSerGluAlaThrArgI leAspProAsnAlaTr

3001 GGTGCAACCGTGAAGCGCGGGCCATTACCAGGCCGAAGCAGCGTTGTTGCACTGACCGGACGATACACTGCTGATGCGGTGCTGATTACGACCGCT

839 pValGluArgTrpLysAlaAlaGlyHisTyrGlnAlaGluAlaAlaLeuLeuGlnCysThrAlaAspThrLeuAlaAspAlaValLeuI leThrThrAla

3101 CACGCGTGGCAGCATCAGGGGAAACCTTATTTATCAGCCGAAAACCTACCGGATTGATGGTAGTGGTCAAATGGCGATTACCGTTGATGTTGAAGTGG

873 HisAlaTrpGlnHisGlnGlyLysThrLeuPheI leSerArgLysThrTyrArgI leAspGlySerGlyGlnMetAlaI leThrValAspValGluValA

3201 CGAGCGATACACCGCATCCGCGCGGATGGCCTGAACCTGCGCAGCTGGCGAGTACGAGAGCGGGTAAACTGGCTCGGATTAGGCGCGCAAGAAAATA

906 IaSerAspThrProHisProAlaArgI leGlyLeuAsnCysGlnLeuAlaGlnValAlaGluArgValAsnTrpLeuGlyLeuGlyProGlnGluAsnTy

BspLU11I (3355)

3301 TCCCGACCGCCTTACTGCCGCTGTTTGGACCGCTGGGATCTGCCATTGTCAGACATGTATACCCCGTACGCTTCCCGAGCGAAAAAGGTCTGCGCTGC
 939▶ rProAspArgLeuThrAlaAlaCysPheAspArgTrpAspLeuProLeuSerAspMetTyrThrProTyrValPheProSerGluAsnGlyLeuArgCys
 3401 GGGACGCGGAATTGAATTATGGCCACACCAAGTGGCGCGGCGACTTCCAGTTCAACATCAGCCGCTACAGTCAACAGCAACTGATGGAAACCAGCCATC
 973▶ GlyThrArgGluLeuAsnTyrGlyProHisGlnTrpArgGlyAspPheGlnPheAsnIeSerArgTyrSerGlnGlnGlnLeuMetGluThrSerHisA

NdeI (3553)

3501 GCCATCTGCTGCACGGGAAGAAGGCACATGGCTGAATATCGACGGTTTCCATATGGGGATTGGTGGCGAGACTCTGGAGCCCGTCACTATCGGGGA
 1006▶ rgHisLeuLeuHisAlaGluGluGlyThrTrpLeuAsnIeAspGlyPheHisMetGlyIleGlyGlyAspAspSerTrpSerProSerValSerAlaGI

NheI (3675)

EcoRI (3669)

3601 ATTACAGCTGAGCGCGGTGCGTACCATTACCAGTTGGTCTGGTGTCAAAAATAATAATCTAGTCCGAGAATTCGCTAGCTCGACATGATAAGATACATTG
 1039▶ uLeuGlnLeuSerAlaGlyArgTyrHisTyrGlnLeuValTrpCysGlnLys•••

3701 ATGAGTTTGGACAAACCACAACCTAGAATGCAGTGAATAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTGAAATTTGTGATGCTATT

MfeI (3849)

3801 GCTTTATTTGTAACCATTATAAGCTGCAATAAACAAGTTAAACAACAACAAATTCATTTCATTTATGTTTCAGGTTTCAGGGGAGGTGTGGGAGGTTTTTTT

PacI (3950)

SwaI (3940)

3901 AAAGCAAGTAAACCTCTACAAATGTGGTAGATCCATTTAAATGTTAATTAAGTCCATGACCAAAATCCCTTAACGTGAGTTTTCGTTCCACTGAGCG
 4001 TCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAACCCGCTACCAGCGGTGG
 4101 TTTGTTTCCGGATCAAGAGCTACCAACTCTTTTCCGAAGGTAAGTGGCTTACGAGAGCGCAGATACCAATACTGTTCTTCTAGTGTAGCCGTAGTT
 4201 AGGCCACCACTTCAAGAACTCTGTAGCACCGCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTGTCTTACC
 4301 GGGTTGGACTCAAGACGATAGTTACCGGATAAGGGCAGCGGTGGGCTGAACGGGGGTTCTGTGCACACAGCCAGCTTGAGCGAACGACCTACACCG
 4401 AACTGAGATACCTACAGCGTGTAGCTATGAGAAAGGCCACGCTTCCCGAAGGGAGAAAGCGGCACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGA
 4501 CGGCACGAGGGAGCTTCCAGGGGAAACGCCTGGTATCTTTATAGTCTGTGCGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCA

PacI (4690)

BspLU11I (4678)

4601 GGGGGCGGAGCCTATGGAAAACGCCAGCAACGGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTAATTAATTTTTCA

AseI (4716)

SfiI (4767)

4701 AAAGTAGTTGACAATTAATCATCGGCATAGTATATCGGCATAGTATAATACGACTCACTATAGGAGGGCCATCATGGCCAAGTTGACCAGTGTGTCCCA
 4801 GTGCTCACAGCCAGGGATGTGGCTGGAGCTGTTGAGTTCTGGACTGACAGTTGGGGTCTCCAGAGATTTGTGGAGGATGACTTTGCAGGTGTGGTCA
 10▶ ValLeuThrAlaArgAspValAlaGlyAlaValGluPheTrpThrAspArgLeuGlyPheSerArgAspPheValGluAspAspPheAlaGlyValValA
 4901 GAGATGATGTCACCTGTTTCATCTCAGCAGTCCAGGACCAAGTGGTGCCTGACAACACCCTGGCTTGGGTGTGGGTGAGAGGACTGGATGAGCTGTATGC
 43▶ rgAspAspValThrLeuPheIeSerAlaValGlnAspGlnValValProAspAsnThrLeuAlaTrpValTrpValArgGlyLeuAspGluLeuTyrAl
 5001 TGAGTGGAGTGGGTGGTCTCCACCAACTTCAGGGATGCCAGTGGCCCTGCCATGCAGAGATTGGAGAGCAGCCCTGGGGGAGAGAGTTGCCCTGAGA
 76▶ aGluTrpSerGluValValSerThrAsnPheArgAspAlaSerGlyProAlaMetThrGluIleGlyGluGlnProTrpGlyArgGluPheAlaLeuArg

PacI (5199)

5101 GACCCAGCAGGCAACTGTGTGCACTTTGTGGCAGAGGAGCAGGACTGAGGATAAGAATTGTAACAAAAACCCCGCCCGGGGTTTTTTGTTAATTA
 110▶ AspProAlaGlyAsnCysValHisPheValAlaGluGluGlnAsp•••

5201 A