



150

BamHI (8)
PstI (7)
SdaI (7)

SalI (44)

NaeI (67)

1 CCGCAGGATCCGCTGGATGCAACTCAGCTGGGGTCAGCTCAGCTCGACTTGGGTTAACTGAGTGCCGGCCTTGTTCTGTCTTTGAATATCAGATAAATGA

 101 GTTACTTAAAATTGTTTCATTGTACTTTTCTGCTCTTTCCTGCCTTACCACAGCCCTGCCAGCTGCCAGGAGGAAGGTCAGCAGA

NcoI (270)
 201 GCTGCTGATAAGAGCCGTATAAAGAGGGTCCGCTCATGGCAAGGGGCAGTGGTCTACTCTCCACACCATGGGGGGTCTCATCATCATCATCAT

MetGlyGlySerHisHisHisHisHisHis

NheI (308)

Bsu36I (369)

Acc65I (364)

301 GGTATGGCTAGCATGACTGGTGGACAGCAAATGGGTCGGGATCTGTACGACGATGACGATAAGGTACCTAAGGATCAGCTTGGAGTTGATCCCCTGTTT
 11> GlyMetAlaSerMetThrGlyGlyGlnGlnMetGlyArgAspLeuTyrAspAspAspAspAspGlnLeuGlyValAspProValValL

401 TACAACGCTGACTGGGAAAACCTGGCGTTACCCAATTAATCGCCTTGCAGCACATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCGCGCAC
 44> euGlnArgArgAspTrpGluAsnProGlyValThrGlnLeuAsnArgLeuAlaAlaHisProProPheAlaSerTrpArgAsnSerGluGluAlaArgTh

FspI (524)

501 CGATCGCCCTCCCAACAGTTCGCGAGCCTGAATGGCGAATGGCGCTTTCCTGTTTCCGGACCAGAAGCGGTGCCGAAAGCTGGCTGGAGTCCGAT
 77> rAspArgProSerGlnGlnLeuArgSerLeuAsnGlyGluTrpArgPheAlaTrpPheProAlaProGluAlaValProGluSerTrpLeuGluCysAsp

Bsu36I (606)

601 CTTCTGAGGCCCATACTGTCTGCTCCCTCAAACCTGGCAGATGCACGGTACGATGCGCCATCTACACCAACGTAACTATCCCATTACGGTCAATC
 111> LeuProGluAlaAspThrValValValProSerAsnTrpGlnMetHisGlyTyrAspAlaProI leTyrThrAsnValThrTyrProI leThrValAsnP

701 CGCGTTTGTCCACGGAGAATCCGACGGTGTACTCGCTCACATTTAATGTTGATGAAAGCTGGCTACAGGAAGGCCAGACCGCAATATTTTTGA
 144> roProPheAlaProThrGluAsnProThrGlyCysTyrSerLeuThrPheAsnValAspGluSerTrpLeuGlnGlyGlnThrArgI leI lePheAs

801 TGGCGTAACTCGGCGTTTCTGTGGTGAACGGCGCTGGTTCAGCGCAGGACAGTCTGTTGCCGTCGAAATTTGACCTGAGCGCATTTTTA
 177> pGlyValAsnSerAlaPheHisLeuTrpCysAsnGlyArgTrpValGlyTyrGlyGlnAspSerArgLeuProSerGluPheAspLeuSerAlaPheLeu

AatII (100):

901 CGCGCCGGAGAAAACCGCTCGCGGTGATGGTCTGCGTTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGATGAGCGGCAATTTTCCGTG
 211> ArgAlaGlyGluAsnArgLeuAlaValMetValLeuArgTrpSerAspGlySerTyrLeuGluAspGlnAspMetTrpArgMetSerGlyI lePheArgA

1001 ACGTCTCGTTGCTGCATAAACCCGACTACAAAATCAGCGATTTCCATGTTGCCACTCGCTTAAATGATGATTTACGCGCGCTGACTGGAGGCTGAAGT
 244> spValSerLeuLeuHisLysProThrThrGlnI leSerAspPheHisValAlaThrArgPheAsnAspPheSerArgAlaValLeuGluAlaGluVa

1101 TCAGATGTGGCGGAGTTGCGTGACTACTACGGTAACAGTTTCTTATGGCAGGGTGAACGCAGGTCCGCCAGCGGACCAGCGCTTCCGGCGGTGAA
 277> IGlMetCysGlyGluLeuArgAspTyrLeuArgValThrValSerLeuTrpGlnGlyGluThrGlnValAlaSerGlyThrAlaProPheGlyGlyGlu

Clal (1206)

1201 ATTATCGATGAGCGTGGTGGTATGCCGATCGCTCACACTACGCTGAACGTCGAAACCCGAACTGTGGAGCGCCGAAATCCCAGTCTCTATCGTG
 311> I leI leAspGluArgGlyGlyTyrAlaAspArgValThrLeuArgLeuAsnValGluAsnProLysLeuTrpSerAlaGlul leProAsnLeuTyrArgA

1301 CGGTGGTTGAACTGCACACCAGCCGACGGCAGCGTATTGAAGCAGAAAGCGATGTCGGTTCGGCGAGGTGCGGATTGAAAATGGTCTGCTGCTGCT
 344> laValValGluLeuHisThrAlaAspGlyThrLeul leGluAlaGluAlaCysAspValGlyPheArgGluValArgI leGluAsnGlyLeuLeuLeuLe

EcoRV (1495)

1401 GAACGGCAGCCGTTGCTGATTCGAGGCGTTAACCGTCACGAGCATCATCTTGCATGGTCAGGTCATGGATGAGCAGACGATGGTGCAGGATATCCTG
 377> uAsnGlyLysProLeuLeul leArgGlyValAsnArgHisGluHisHisProLeuHisGlyGlnValMetAspGluGlnThrMetValGlnAspl leLeu

DraIII (1572)

1501 CTGATGAAGCAGAACAACCTTAAACCGCTGCGCTGTTTCGATTATCCGAACCATCCGCTGTGGTACACGCTGTGCGACCGCTACGGCCTGTATGGTGG
 411> LeuMetLysGlnAsnAsnPheAsnAlaValArgCysSerHisTyrProAsnHisProLeuTrpTyrThrLeuCysAspArgTyrGlyLeuTyrValAla

SspI (1612)

1601 ATGAAGCAATATTTGAAACCCACGGCATGGTGCATGAATCGTCTGACCGATGATCCGCGCTGGCTACCGCGATGAGCGAACCGTAACGCGAATGGT
 444> spGluAlaAsnI leGluThrHisGlyMetValProMetAsnArgLeuThrAspAspProArgTrpLeuProAlaMetSerGluArgValThrArgMetVa

BsaBI (1708)

1701 GCAGCGGATCGTAATACCCGAGTGTATCATCTGGTTCGCTGGGGAATGAATCAGGCCACGGCGCTAATCAGACGCGCTGTATCGCTGGATCAAATCT
 477> IGlArgAspArgAsnHisProSerVal I leI leTrpSerLeuGlyAsnGluSerGlyHisGlyAlaAsnHisAspAlaLeuTyrArgTrpl leLysSer

BssHIII (1880)

1801 GTCGATCCTTCCCGCCCGTGCAGTATGAAGCGCGGAGCCGACACACGGCCACCGATATATTTGCCCGATGTACCGCGCTGGATGAAGACCAGC
 511> ValAspProSerArgProValGlnTyrGluGlyGlyAlaAspThrThrAlaThrAspl I leI leCysProMetTyrAlaArgValAspGluAspGlnP

1901 CTTCCCGGCTGTCCGAAATGGTCCATCAAAAAATGGCTTTCGCTACCTGGAGAGACGGCCCGCTGATCCTTTCGGAATACGCCACGCGATGGGTAA
 544> roPheProAlaValProLysTrpSerI leLysLysTrpLeuSerLeuProGlyGluThrArgProLeu leLeuCysGluTyrAlaHisAlaMetGlyAs

2001 CAGTCTGGCGGTTTCGCTAAAATACTGGCAGGCTTTCGCTCAGTATCCCGTTCACAGGCGGCTTTCGCTGGACTGGGTGATCAGTCGCTGATTA
 577> nSerLeuGlyGlyPheAlaLysTyrTrpGlnAlaPheArgGlnTyrProArgLeuGlnGlyGlyPheValTrpAspTrpValAspGlnSerLeul leLys

2101 TATGATGAAAACGGCAACCCGTGGTTCGGCTTACGGCGGTGATTTTGGCGATAACCGAAGCAGTCCAGTTCTGATGAACGGTCTGGTCTTTCGCGACC
 611> TyrAspGluAsnGlyAsnProTrpSerAlaTyrGlyGlyAspPheGlyAspThrProAsnAspArgGlnPheCysMetAsnGlyLeuValPheAlaAspA

Eco47III (2217)

2201 GCACGCCGATCCAGCGCTGACGGAAGCAAACACCAGCAGAGTTTTTCCAGTTCGCTTATCCGGCAAACCATCGAAGTGACCAGCGAATACCTGTT
 644> rgThrProHisProAlaLeuThrGluAlaLysHisGlnGlnGlnPhePheGlnPheArgLeuSerGlyGlnThrl I leGluValThrSerGluTyrLeuPh

SacI (2322)

2301 CCGTCATAGCGATAACGAGCTCCTGCCTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCCTCTGGATGTCGCTCCACAAGGTA
 677> eArgHisSerAspAsnGluLeuLeuHisTrpMetValAlaLeuAspGlyLysProLeuAlaSerGlyGlnSerGlyGlnSerGlyValAlaProGlnGlyLys

2401 CAGTTGATTGAATGCCTGAACACCGCAGCGAGAGCGCGGCGGCAACTGGCTCACAGTACGCTAGTGCACACCGAACCGACCGCATGGTCAGAA
 711> GlnLeul leGluLeuProGluLeuProGlnProGluSerAlaGlyGlnLeuTrpLeuThrValArgValValGlnProAsnAlaThrAlaTrpSerGluA

2501 CCGGCACATCAGCGCTGGCAGCAGTGGCTTGGCGGAAACCTCAGTGTGACGCTCCCCCGCGTCCCAGCCATCCGCGATCTGACACCCAGCGA
 744> laGlyHisI leSerAlaTrpGlnGlnTrpArgLeuAlaGluAsnLeuSerValThrLeuProAlaAlaSerHisAlal leProHisLeuThrThrSerGI

2601 AATGGATTTTTCAGCTGGTAATAAGCGTTGGCAATTAACCGCAGTCAAGCTTCTTTCCAGATGTGGATTGGCGATAAAAAACAACCTGCTG
 777> uMetAspPheCysl I leGluLeuGlyAsnLysArgTrpGlnPheAsnArgGlnSerGlyPheLeuSerGlnMetTrpl I leGlyAspLysLysGlnLeuLeu

2701 ACGCCGCTGCGCATCAGTTCACCCGTGACCCGCTGGATAACGACATTGGCGTAAGTGAAGCGACCCGATTGACCTAACCGCTGGTTCGAACCGTGG
 811> ThrProLeuArgAspGlnPheThrArgAlaProLeuAspAsnAspl I leGlyValSerGluAlaThrArgI leAspProAsnAlaTrpValGluArgTrpL

2801 AGCGCGGCGCATTACAGGCCGAAGCAGCGTTGTTGTCAGTGCACGGCAGATACACTTGCTGATGCGGTGCTGATTACGACCCTCACCGTGGCAGCA
 844> ysAlaAlaGlyHisTyrGlnAlaGluAlaAlaLeuLeuGlnCysThrAlaAspThrLeuAlaAspAlaValLeul leThrThrAlaHisAlaTrpGlnHi

2901 TCAGGGGAAAACCTTATTATCAGCCGAAAACCTACCGATTGATGGTAGTGGTCAAATGGCGATTACCGTTGATGTTGAAGTGGCGAGCGATACACCG
 877▶ sGlnGlyLysThrLeuPheI leSerArgLysThrTyrArgI leAspGlySerGlyGlnMetAlaI leThrValAspValGluValAlaSerAspThrPro
 3001 CATCCGGCGCGGATTGGCTGAACTGCCAGCTGGCGCAGGTAGCAGAGCGGGTAACTGGCTCGATTAGGGCCGAAGAAAATATCCCGACCGCTTA
 911▶ HisProAlaArgI leGlyLeuAsnCysGlnLeuAlaGlnValAlaGluArgValAsnTrpLeuGlyLeuGlyProGlnGluAsnTyrProAspArgLeuT
Bst1107I (3144)
BspLU11I (3141) BsiWI (3152)
 3101 CTGCCGCTGTTTTGACCGCTGGGATCTGCCATTGTCCAGACATGTATACCCCGTACGCTTCCCGAGCGAAAACGGTCTGCGCTGCGGGACGCGGAATT
 944▶ hrAlaAlaCysPheAspArgTrpAspLeuProLeuSerAspMetTyrThrProTyrValPheProSerGluAsnGlyLeuArgCysGlyThrArgGluLe
 3201 GAATTATGGCCACACCACTGGCGCGGCGACTTCCAGTTCAACATCAGCCGCTACAGTCAACAGCAACTGATGGAACCAGCCATCGCCATCTGCTGCAC
 977▶ uAsnTyrGlyProHisGlnTrpArgGlyAspPheGlnPheAsnI leSerArgTyrSerGlnGlnGlnLeuMetGluThrSerHisArgHisLeuLeuHis
NdeI (3339)
 3301 GCGGAAGAAGGCACATGGCTGAATATCGACGGTTTCCATATGGGGATTGGTGGCGAGACTCCTGGAGCCCGTCAGTATCGCGGAATTACAGCTGAGCG
 1011▶ AlaGluGluGlyThrTrpLeuAsnI leAspGlyPheHisMetGlyI leGlyGlyAspAspSerTrpSerProSerValSerAlaGluLeuGlnLeuSerA
NheI (3461)
EcoRI (3455)
 3401 CCGTTCGCTACCATTACCAGTTGGTCTGGTGTCAAAAATAATAATCTAGTCGAGAATTCGCTAGCTCGACATGATAAGATACATTGATGAGTTTGACAA
 1044▶ laGlyArgTyrHisTyrGlnLeuValTrpCysGlnLys•••
 3501 ACCACAAC TAGAATGCAGTGAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAAC

MfeI (3635) DraI (3684)
 3601 CATTATAAGCTGCAATAAACAAGTTAAACAACAACAATTGCATTCATTTTATGTTTCAGGTTCAGGGGAGGTGTGGGAGTTTTTTAAAGCAAGTAAAC

DraI (3723)
SwaI (3726)
 3701 CTCTACAAATGTGGTAGATCCATTTAAATGTTAATTAAGTACGCATGACCAAAATCCCTAACGTGAGTTTTTCGTTCCACTGAGCGTCAGACCCGTAGA

 3801 AAAGATCAAAGGATCTTCTTGAGATCCTTTTTCTCGCGTAATCTGCTGCTTGCAAAACAAAAAACACCCTACCAGCGGTGGTTTGTGGCGGAT

 3901 CAAGAGCTACCAACTCTTTTTCCGAAGGTAAGTGGCTTCAGCAGAGCGCAGATACCAAACTGTTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCA

 4001 AGAACTCTGTAGCACCGCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGGTTGGACTCAAG

 4101 ACGATAGTTACCGATAAAGCGCAGCGGTGCGGCTGAACGGGGGTTCTGTGCACACAGCCAGCTTGAGCGAACGACCTACACCGAACTGAGATACCTA

 4201 CAGCGTGAGCTATGAGAAAGCGCCACGCTTCCGAAGGGAGAAAGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGC

 4301 TTCCAGGGGAAACGCCTGGTATCTTTATAGTCTGTGCGGTTTTGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGCGGAGCCT

BspLU11I (4464) AseI (4502)
 4401 ATGGAAAAACGCCAGCAACCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTAAATTAATTTTTCAAAGTAGTTGACAA

MscI (4564)
SfiI (4553)
 4501 TTAATCATCGGCATAGTATATCGGCATAGTATAATACGACTCACTATAGGAGGGCCATCATGGCCAAGTTGACCAGTGCTGCCAGTGCTCACAGCCA
1▶ MetAlaLysLeuThrSerAlaValProValLeuThrAlaA
 4600 GGGATGTGGCTGGAGCTGTTGAGTTCTGGACTGACAGGTTGGGGTCTCCAGAGATTTGTGGAGGATGACTTTGCAGGTGGTGCAGAGATGATGTCAC
 14▶ rgAspValAlaGlyAlaValGluPheTrpThrAspArgLeuGlyPheSerArgAspPheValGluAspAspPheAlaGlyValValArgAspAspValTh
 4700 CCTGTTTCATCTCAGCAGTCCAGGACCGGTGGTGCCTGACAACCCCTGGCTTGGGTGGGTGAGAGGACTGGATGAGCTGTATGCTGAGTGGAGTGAG
 47▶ rLeuPheI leSerAlaValGlnAspGlnValValProAspAsnThrLeuAlaTrpValTrpValArgGlyLeuAspGluLeuTyrAlaGluTrpSerGlu
 4800 GTGGTCTCCACCAACTTCAGGGATGCCAGTGGCCTGCCATGACAGAGATTGGAGAGCAGCCCTGGGGAGAGAGTTTGCCCTGAGAGACCCAGCAGGCA
 81▶ ValValSerThrAsnPheArgAspAlaSerGlyProAlaMetThrGluI leGlyGluGlnProTrpGlyArgGluPheAlaLeuArgAspProAlaGlyA
DraIII (4914)
 4900 ACTGTGTGCACTTTGTGGCAGAGGAGCAGGACTGAGGATAAGAATTGTAACAAAAACCCCGCCCGGGGTTTTTTGTTAATTA
 114▶ snCysValHisPheValAlaGluGluGlnAsp•••