



PvuI (7)
SgfI (6)
MfeI (82)

1 GGATCTGGATCGCTCCGGTGCCCGTCAGTGGGAGAGCGCACATCGCCACAGTCCCGGAGAAGTTGGGGGAGGGGTGGCAATTGAACGGGTGCCTA

101 GAGAAAGTGGCGCGGGTAAACTGGAAAGTGATGTCGTACTGGCTCCGCCTTTTCCGAGGGTGGGGGAGAACCCTATATAAGTGCAGTAGTCGCC

Psp1406I (203)
HindIII (245)

201 GTGAACGTTCTTTTTCGCAACGGGTTTGCCGCCAGAACACAGCTGAAGCTTCGAGGGGCTCGCATCTCTCCTTACAGCGCCGCCCTACCTGAGGCC

301 GCCATCCACGCGGGTTGAGTCGCGTTTCTGCCGCCTCCCGCCTGTGGTGCCTCCTGAAGCTCGTCCGCCGTCTAGGTAAGTTAAAGCTCAGGTCGAGACC

NgoMI (441)
NaeI (441)

401 GGGCCTTTGTCCGGCGCTCCCTTGAGCCTACCTAGACTCAGCGGCTCTCCACGCTTTGCTGACCCTGCTTGTCAACTCTACGTCTTTGTTTCGTTT

NcoI (560)
BstEII (555)
KasI (535)
AgeI (552)

501 TCTGTTCTGCGCCGTTACAGATCCAAGCTGTGACCGGGCCCTACTGAGATCACCGGTACCATGGAGCTTCGGTCTACCAATGGGAGGTGATCATGCC

1Me tGl uLeuArgSer TyrGl nTrpGl uVal I I eMe tPr

601 TGCCCTGGAGGGCAAGAATATCATCTCTGGCTGCCACGGGTGCCGGGAAGACC GGCGGCTGCTTATGTGCCAAGCGGCACCTAGAGACTGTGGAT

13>oAl aLeuGl uGl yLysAsnI I eI I eI I eTrpLeuP roThr Gl yAl aGl yLysThr ArgAl aAl aAl aTyrVal I Al aLysArgHi sLeuGl uThr Val Asp

DraIII (733)
ApaLI (730)
BstEII (738)
SphI (767)

701 GGAGCCAAGGTGGTTGTATTGGTCAACAGGGTGACCTGGTGACCCAGCATGGTGAAGAGTTCAGGCGCATGCTGGATGGACGCTGGACCGTGACAACCC

47>Gl yAl aLysVal I Val I LeuVal AsnArgVal I Hi sLeuVal Thr Gl nHi sGl yGl uGl uPheArgArgMe tLeuAspGl yA rgT rpThr Val I Thr Thr L

801 TGAGTGGGACATGGACACAGTCTGGCTTTGGCCACCTGGCCCGGTGCCATGACCTGCTCATCTGCACAGCAGAGCTTCTGCAGATGGCACTGACCAG

80>euSer Gl yAspMe tGl yProArgAl aGl yPheGl yHi sLeuAl aArgCysHi sAspLeuLeu I I eCysThr Al aGl uLeuLeuGl nMe tAl aLeuThr Se

Thh11I (976)
BspHI (995)

901 CCCCAGGAGGAGGAGCAGCTGGAGTCACTGTCTTCTCCCTGATCGTGGTGGATGAGTGCCACCACACGCACAAGGACACCGTCTACAACGTCATCATG

113>r ProGl uGl uGl uHi sVal Gl uLeuThr Val I PheSer LeuI I eVal Val AspGl uCysHi sHi sThr Hi sLysAspThr Val I TyrAsnVal I I eMe t

1001 AGCCAGTACCTAGAACTTAAACTCCAGAGGGCACAGCCGCTACCCAGGTGCTGGTCTCACAGCCTCCCAAGGCACTGGCGGGCCCTCAAACCTCGATG

147>Ser Gl nTyrLeuGl uLeuLysLeuGl nArgAl aGl nProLeuP roGl nVal I LeuGl yLeuThr Al aSer P roGl yThr Gl yGl yAl aSer LysLeuAspG

DraIII (1140)

1101 GGGCCATCAACCAGCTCTGCAGCTCTGTGCCAAGTTGGACACGTTGGTGCATCATGTACCCCAAGTGTGCCCCAGCTGCAGGAGCACAGCCAACA

180>I yAl aI I eAsnHi sVal I LeuGl nLeuCysAl aAsnLeuAspThr TrpCysI I eMe tSer P roGl nAsnCysCysP roGl nLeuGl nGl uHi sSer Gl nGl

1201 GCCTTGCAACAGTACAACCTCTGCCACAGGCGCAGCCAGGATCCGTTTGGGGACTTGCTGAAGAAGTTCATGGACCAATCCATGACCACCTGGAGATG

213>nProCysLysGl nTyrAsnLeuCysHi sArgArgSer Gl nAspP roPheGl yAspLeuLysLysLeuMe tAspGl nI I eHi sAspHi sLeuGl uMe t

1301 CCTGAGTTGAGCGGAAATTTGGGACGCAAAATGTATGAGCAGCAGTGGTGAAGCTGAGTGAGGCTGCGGCTTTGGCTGGGCTCAGGAGCAACGGGTG

247>P roGl uLeuSer ArgLysPheGl yThr Gl nMe tTyrGl uGl nGl nVal I Val I LysLeuSer Gl uAl aAl aAl aLeuAl aGl yLeuGl nGl uGl nArgVal I T

Thh11I (1444)
BsaBI (1483)

1401 ATGCGCTTACCTGAGGCGCTACAATGACGCGCTGCTCATCCATGACACCGTCCGCGCGCTGGATGCCTTGGCTGCGCTGCAGGATTTCTATCACAGGGA

280>yr Al aLeuHi sLeuArgArgTyrAsnAspAl aLeuLeu I I eHi sAspThr Val I ArgAl aVal I AspAl aLeuAl aAl aLeuGl nAspPheTyrHi sArgI

NgoMI (1535)
NaeI (1535)

1501 GCACGTCACTAAAACCCAGATCCTGTGTGCCGAGCGCCGCTGCTGGCCCTGTTGCATGACCGCAAGAATGAGCTGGCCCACTTGGCAACTCATGGCCCA

313>uHi sVal I Thr LysThr Gl nI I eLeuCysAl aGl uArgArgLeuLeuAl aLeuPheAspAspArgLysAsnGl uLeuAl aHi sLeuAl aThr Hi sGl yPro

1601 GAGAAATCCAAAACCTGGAGATGCTGGAAAAGATCCTGCAAGAGCAGTTCAGTAGCTTAACAGCCCTCGGGGTATCATCTTCAACCCGACCCGCCAAAGCG

347>Gl uAsnP roLysLeuGl uMe tLeuGl uLysI I eLeuGl nArgGl nPheSer Ser SerAsnSer P roArgGl yI I eI I ePheThr ArgThr ArgGl nSer A

Bsp120I (1757)

1701 CACTCCCTCCTGCTCTGGCTCCAGCAGCAGCAGGGCCTGCAGACTGTGGACATCCGGGCCAGCTACTGATTGGGGCTGGGAACAGCAGCCAGAGCAC

380>I aHi sSer LeuLeuLeuTrpLeuGl nGl nGl nGl nGl yLeuGl nThr Val I AspI I eArgAl aGl nLeuLeu I I eGl yAl aGl yAsnSer Ser Gl nSer Th

BstXI (1871)

1801 CCATGACCCAGAGGGACCAGCAAGAAGTGATCCAGAAGTTCGAAGTGAACCTTCTGTTGGCCAGAGTGTGGCGGAGGAGGGGCTGGAC

413>r Hi sMe tThr Gl nArgAspGl nGl nGl uVal I I eGl nLysPheGl nAspGl yThr LeuAsnLeuLeuVal I Al aThr Ser Val I Al aGl uGl uGl yLeuAsp

SmaI (1976)
MluI (1997)
NcoI (1952)
SrfI (1975)
Bst1107I (1993)

1901 ATCCACATTGCAATGTGGTGGTGCCTATGGGCTCTTGACCAATGAAATCTCCATGGTCCAGGCCAGGGGCCGTGCCCGGGCCGATCAGAGTGATACG

447>I I eProHi sCysAsnVal I Val I ArgTyrGl yLeuLeuThrAsnGl uI I eSer Me tVal I Gl nAl aArgGl yA rgAl aA rgAl aAspGl nSer Val I TyrA

2001 CGTTTGTAGCAACTGAAGGTAGCCGGGAGCTGAAGCGGGAGCTGATCAACGAGGCGCTGGAGACGCTGATGGAGCAGGCACTGGCTGCTGCAGAAAAT

480>I aPheVal I Al aThr Gl uGl ySer ArgGl uLeuLysArgGl uLeuI I eAsnGl uAl aLeuGl uThr LeuMe tGl uGl nAl aVal I Al aAl aVal I Gl nLysMe

2101 GGACCAGGCCGAGTACCAGGCCAAGATCCGGATCTGCAGCAGGCAGCCTTGACCAAGCGGGCGGCCAGGCAGCCAGCGGAGAACCGGCAGCAGCAG

513>tAspGl nAl aGl uTyrGl nAl aLysI I eArgAspLeuGl nGl nAl aAl aLeuThr LysArgAl aAl aGl nAl aAl aGl nArgGl uAsnGl nArgGl nGl n

NcoI (2253)

2201 TTCCAGTGGAGCACGTGCAGCTACTCTGCATCAACTGCATGGTGGCTGTGGCCATGGCAGCGACCTGCGGAAGGTGGAGGGCACCCACCATGTCAATG

547>PheProVal I Gl uHi sVal I nLeuLeuCysI I eAsnCysMe tVal I Al aVal I Gl yHi sGl ySerAspLeuArgLysVal I Gl uGl yThr Hi sHi sVal I AsnV

2301 TGAACCCCAACTTCTCGAATACTATAATGTCTCCAGGATCCTGTGGTGCATCAACAAAGTCTTCAAGGACTGGAAGCCTGGGGGTGCATCAGCTGCAG

580>aI AsnP roAsnPheSerAsnTyrTyrAsnVal I Ser ArgAspP roVal I I eAsnLysVal I PheLysAspTrpLysP roGl yGl yVal I I eSer CysAr

SphI (2471)

2401 GAACTGTGGGAGGTCTGGGCTGCAGATGATCTACAAGTCAAGTGAAGTGCAGTGCCTCAAAGTCCGACAGCTGCTGCTGGAGACCCCTCAGGGGCGG

613>gAsnCysGl yGl uVal I TrpGl yLeuGl nMe tI I eTyrLysSer Val I LysLeuP roVal I LeuLysVal I A rgSer Me tLeuLeuGl uThr P roGl nGl yA rg

2501 ATCCAGGCCAAAAGTGGTCCCGCTGCCCTTCTCCGTGCCTGACTTTGACTTCTGCAGCATTGTGCCGAGAAGTGTGCGGACCTCTCCCTGGACTGAC

647>I I eGl nAl aLysLysTrpSerArgVal I P roPheSer Val I P roAspPheAspPheLeuGl nHi sCysAl aGl uAsnLeuSerAspLeuSer LeuAsp•••

NheI (2612)
 2601 CACCTCATTGCTGCTAGCTGCCAGACATGATAAGATACATTGATGAGTTTGGACAAACCACAACCTAGAATGCAGTGAAAAAATGCTTTATTTGTGAAA

HpaI (2750) MfeI (2761)
 2701 TTTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAAACAAAGTTAAACAACAACATTGCATTCATTTTATGTTTCAGGTTACAGGGGAGGT

EcoRI (2846)
 2801 GTGGGAGGTTTTTTAAAGCAAGTAAACCTCTACAAATGTGGTATGGAATCTAAAATACAGCATAGCAAACTTTAACCTCCAAATCAAGCCTCTACTT
 2901 GAATCCTTTTCTGAGGGATGAATAAGGCATAGGCATCAGGGGCTGTGCCAATGTGCATTAGCTGTTGCAGCCTCACCTCTTTCATGGAGTTAAGAT

SspI (3085) SmaI (3099)
 3001 ATAGTGTATTTTCCAAGGTTTGAAGTACTGCTCTTCATTCTTTATGTTTTAAATGCACTGACCTCCACATTCCTTTTATAGTAAAATATTCAGAAAATAA
 3101 TTTAAATACATCATTGCAATGAAAATAAATGTTTTTTATTAGCGAGAATCCAGATGCTCAAGGCCCTTCATAATATCCCCAGTTTAGTAGTTGGACTTA
 3201 GGGAAACAAAGAACCTTTAATAGAAATTGGACAGCAAGAAAGCGAGCTTCTAGCTTTAGTTCCTGGTGTACTTGAGGGGGATGAGTTCCTCAATGGTGGT
 141 •••AsnArgThr TyrLysLeuProIleLeuGluGlyIleThrThr
BstXI (3389)

3301 TTTGACCAGCTTGCCATTCATCTCAATGAGCACAAAGCAGTCAGGAGCATAGTCAGAGATGAGCTCTCTGCACATGCCACAGGGGCTGACCACCTGATG
 126 LysValLeuLysGlyAsnMetGluIleLeuValPheCysAspProAlaTyrAspSerIleLeuGluArgCysMetGlyCysProSerValValArgIleS
 3401 GATCTGCCACCTCATCAGAGTAGGGTGCCTGACAGCCACAATGGTGTCAAAGTCTTCTGCCGTTGCTCACAGCAGCCCAATGGCAATGGCTTCAG
 92 erArgAspValGluAspSerTyrProHisArgValAlaValIleThrAspPheAspLysGlnGlyAsnSerValAlaSerGlyIleAlaIleAlaGluAla
StuI (3524)

3501 CACAGACAGTGACCTGCCAATGTAGGCCTCAATGTGGACAGCAGAGATGATCTCCCAAGTCTTGGTCTGATGGCCGCCGACATGGTGTCTGTTGTC
 59 aCysValThrValArgGlyIleTyrAlaGluIleHisValAlaSerIleIleGluGlyThrLysThrArgIleAlaAlaGlyValHisHisLysAsnAsp
BspHI (3674)

XmnI (3666)
 3601 CTCATAGAGCATGGTGTCTTCTCAGTGGCGACCTCCACAGCTCCAGATCCTGCTGAGAGATGTTGAAGGCTTTCATGATGGCCCTCTATAGTGAGTC
 26 GluTyrLeuMetThrIleLysGluThrAlaValGluValLeuGluLeuAspGlnGlnSerIleAsnPheThrLysMet

AseI (3732)
 3701 GTATTATACTATGCCGATATACTATGCCGATGATTAATTGCAAAACAGCGTGGATGGCGTCTCCAGCTTATCTGACGGTCACTAAACGAGCTCTGCTT

SpeI (3887)
 3801 ATATAGACCTCCACCGTACACGCCTACCGCCATTTGCGTCAATGGGCGGAGTTGTTACGACATTTTGGAAAGTCCCGTTGATTTACTAGTCAAAAC
 3900 AAACCTCCATTGACGTCAATGGGGTGGAGACTTGAAATCCCCGTGAGTCAAACCGCTATCCACGCCATTGATGTAAGTCCAAAACCGCATCATCATGG

SnaBI (4015)
 4000 TAATAGCGATGACTAATACGTAGATGTAAGTCCCAAGTAGGAAAGTCCCATAAGGTCATGTAAGTGGGCATAATGCCAGGCGGGCCATTACCGTCATTGAC

NdeI (4120)
 4100 GTCAATAGGGGGCTACTTGGCATATGATACACTTGTACTGCAAGTGGGCGAGTTTACCGTAAATACTCCACCCATTGACGTCAATGAAAGTCCCT

SdaI (4298)
 4200 ATTGGCGTACTATGGGAACATACGTCATTATTGACGTCAATGGGCGGGGTCGTTGGGCGGTGAGCCAGGCGGGCCATTACCGTAAGTTATGTAACGC

PacI (4306) BspLU11I (4316)
 4300 CTG C A G G T T A A T T A A G A A C A T G T G A G C A A A A G G C C A G C A A A A G G C C A G G A A C C G T A A A A A G C C G C G T T G C T G G C G T T T T C C A T A G G C T C C G C C C C
 4398 CTGACGAGCATCACAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCTGGAAGCTCCCTCGTGCG
 4498 CTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTCTCCCTTCGGGAAGCGTGGCGCTTCTCATAGCTCACGCTGTAGGTATCTCAGT

ApaLI (4630)
 4598 TCGGTGTAGGTGCTTTCGCTCAAGCTGGGCTGTGTGCACGAACCCCGTTGAGCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGTAGTCAACC
 4698 CGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCC
 4798 TAACTACGGCTACACTAGAAGAAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAAACAA
 4898 ACCACCGCTGGTAGCGGTGGTTTTTTTTGTTGCAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTG

EagI (5066) NotI (5065)
 4998 ACGCTCAGTGAACGAAAACCTCACGTTAAGGGATTTTGGTTCATGGCTAGTTAATTAACATTTAAATCAGCGGCCCAATAAAAATATCTTTATTTTCATTA
 5098 CATCTGTGTGTTGGTTTTTTGTGTGAATCGTAACATAAGCTCTCCATCAAAACAAAACGAAACAAAACAACTAGCAAAATAGGCTGTCCCGAGTG
 5198 CAAGTGCAGGTGCCAGAATTTCTCTATCGAA