



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

1 GGATCTGCGATCGCTCCGGTGCCCGTCAGTGGGCAGAGCCACATCGCCACAGTCCCCGAGAAGTTGGGGGAGGGGTGGCAATTGAACGGGTGCCTA
 101 GAGAAGGTGGCGGGGTAAGTGGAAAGTGATGCTGTACTGGCTCCGCCTTTTCCGAGGGTGGGGGAGAACCCTATATAAGTGCAGTAGTCGCC

Psp1406I (203)
HindIII (245)
Bsu36I (291)

201 GTGAACGTTCTTTTTCGCAACGGGTTTCCGCCAGAACACAGCTGAAGCTTCGAGGGGCTCGCATCTCTCTTACAGCGCCCGCCGCCCTACCTGAGGCC
 301 GCCATCCACGCCGGTTGAGTGCAGTCTGCCGCTCCCGCCTGTGGTGCTCTCTGAAGTGCCTCCGCCGTCTAGGTAAGTTTAAAGCTCAGGTCGAGACC

NgoMIV (441)
NgoMI (441)
NaeI (441)

401 GGGCCTTTGTCCGGCGCTCCCTTGAGCCTACCTAGACTCAGCCGGCTCTCCACGCTTTGCTGACCCTGCTTGTCAACTCTACGTCTTTGTTTCGTTT

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

501 TCTGTTCTGCGCCGTTACAGATCCAAGCTGTGACCGGCCCTACCTGAGATCACCGGTACCATTGGCTGGGTGCGTGTGGGAAAAGCTGCCGACGC
 1▶Me tAl aGl yVal lAl aCysLeuGl yLysAl aAl aAspAl

XmaI (684)
SmaI (684)
Bsp120I (681)

601 AGATGAATGGTGCAGCAGCGCCCTGGGCTCCCTGGTCCGGACGACGCGCCCGGAGGACCTGGGTTGGGCGGGAGTTGGGCCGGGGCTGCTGTGG
 13▶aAspGl uTrpCysAspSer Gl yLeuGl ySer LeuGl yProAspAl aAl aAl aProGl yGl yProGl yLeuGl yAl aGl uLeuGl yProGl yLeuSer Trp
 701 GCTCCCCTCGTCTTCGGCTACGTCACTGAGGATGGGACACGGCACTGCACCTGGCTGTGATTATCAGCATGAACCTTCTGGATTTCTTCTAGGCT
 47▶Al aProLeuVal lPheGl yTyrVal lThr Gl uAspGl yAspThr Al aLeuHi sLeuAl aVal l l eHi sGl nHi sGl uProPheLeuAspPheLeuLeuGl yP

NgoMIV (805)
NgoMI (805)
NaeI (805)

801 TCTCGCCGGCAGTACATGGACCTGCAGAAATGACCTAGGCCAGACAGCCCTGCACCTGGCAGCCATCCTGGGGAGACATCCACGGTGGAGAAGCT
 80▶heSer Al aGl yThr Gl uTyrMetAspLeuGl nAsnAspLeuGl yGl nThr Al aLeuHi sLeuAl aAl a l l eLeuGl yGl uThr Ser Thr Val l Gl uLysLe
 901 GTACGCAGCAGGCCCGGGCTGTGTGTGGCGGAGCGTAGGGCCACACGGCGTGCACCTGGCTGCCGTGTGGGGCACACGCTGTGCCCGTGCCTGT
 113▶uTyrAl aAl aGl yAl aGl yLeuCysVal lAl aGl uArgArgGl yHi sThr Al aLeuHi sLeuAl aCysArgVal l Gl yAl aHi sAl aCysAl aArgAl aLeu

Bsp120I (1053)

1001 CTTAGCCCGCCCGCGCCCGAGGAAAGCCCGACACCTACCTGCTCAGGGCCCTGACCGTACTCCGACACCAACCATACCCCTGTGCGCTTGT
 147▶LeuGl nProArgP roArgArgP roArgGl uAl aProAspThr TyrLeuAl aGl nGl yProAspArgThr P roAspThrAsnHi s Thr P roVal lAl aLeuT

PmlI (1195)
Eco72I (1195)
BbrPI (1195)

1101 ACCCCGATTCCGACTTGGAGAAGGAAGAAGAGGAGAGTGGAGGAGTGGAAAGCTGCAGCTGGAGGCTGAAAACACGAGGGCCACACCCCACTCCACGT
 180▶y rP roAspSerAspLeuGl uLysGl uGl uGl uSer Gl uGl uAspTrpLysLeuGl nLeuGl uAl aGl uAsnTyrGl uGl yHi sThr P roLeuHi sVa

PmlI (1275)
Eco72I (1275)
BbrPI (1275)

1201 GGCGTTATCCACAAAGATGTGGAGATGGTCCGGCTGCTCCGAGATGCTGGAGCTGACCTTGACAAACCGAGCCACGTGCGGCCGGAGCCCCCTTCAT
 213▶lAl aVal l l eHi sLysAspVal l Gl uMetVal lArgLeuLeuArgAspAl aGl yAl aAspLeuAspLysP roGl uP roThr CysGl yArgSer P roLeuHi s

Bsu36I (1341)

1301 TTGGCAGTGGAGGCCAGGCAGCCGATGTGCTGGAGCTTCTCCTGAGGGCAGCCGCAACCTGCTGCCCGCATGTACGGTGGCCGACCCCACTCGGCA
 247▶LeuAl aVal l Gl uAl aGl nAl aAl aAspVal l LeuGl uLeuLeuLeuArgAl aGl yAl aAsnP roAl aAl aArgMetTyrGl yGl yArgThr P roLeuGl yS

ApaI (1442)

1401 GTGCCATGCTCCGGCCCAACCCATCCTCGCCCGCCTCCTCCGTGCACACGGAGCCCTGAGCCCGAGGGCGAGGACGAGAAATCCGGCCCTGCAGCAG
 280▶erAl aMetLeuArgP roAsnP rol l eLeuAl aArgLeuLeuArgAl aHi sGl yAl aP roGl uP roGl uGl yGl uAspGl uLysSer Gl yP roCysSer Se
 1501 CAGTAGCGACAGCGACAGCGGAGACGAGGGCGATGAATACGACGACATTTGTGGTTCACAGCAGCCGCAACCCCGCTGCCCTCCACCCAGCCTCA
 313▶r Ser SerAspSerAspSer Gl yAspGl uGl yAspGl uTyrAspAsp l l eVal lVal lHi sSer Ser ArgSer Gl nThr ArgLeuP roP roThr P roAl aSer

MscI (1644)
BalI (1644)
NheI (1638)

1601 AAACCTTCTCCTGACGACCCCGCCCGTGTGATTGTGCTAGCTGGCCAGACATGATAAGATACATTGATGAGTTTGGACAACCAACTAGAATGCA
 347▶LysP roLeuP roAspAspP roArgP roVal l ●●●

HpaI (1776)
MfeI (1787)

1701 GTGAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAAACAAAGTTAAACAACAACAAATTGCATTCAT

EcoRI (1872)

1801 TTTATGTTTCAGGTTTCAGGGGAGGTGTGGGAGGTTTTTAAAGCAAGTAAAACCTCTACAAATGTGGTATGGAATTCATAAAATACAGCATAGCAAACT
 1901 TTAACCTCAAATCAAGCCTCTACTTGAATCCTTTTCTGAGGGATGAATAAGGCATAGGCATCAGGGGCTGTTGCCAATGTGCATTAGCTGTTTGACGCC
 2001 TCACCTTCTTTCATGGAGTTAAGATATAGTGATTTTCCAAGGTTTGAAGTACTCTTCATTTCTTTATGTTTAAATGCACTGACCTCCACATTCC

SspI (2111)
SwaI (2125)

2101 CTTTTAGTAAAAATATTCAGAAATAATTTAAATACATCATTGCAATGAAAATAAATGTTTTTTATTAGGCAGAATCCAGATGCTCAAGGCCCTTCATAAT

2201 ATCCCCAGTTTAGTAGTTGGACTTAGGGAACAAAGAACCTTTAATAGAAATGGACAGCAAGAAAGCGAGCTTCTAGCTTTAGTTCCTGGTACTTG
141◆●●●AsnArgThr TyrLysL
SacI (2386)

2301 AGGGGATGAGTTCCTCAATGGTGGTTTTGACCAGCTTGCATTCAATGAGCACAAGCAGTCAGGAGCATAGTCAGAGATGAGCTCTGCACA
134◆euProI l eLeuGl uGl ul l eThr Thr LysVal LeuLysGl yAsnMetGl ul l eLeuVal PheCysAspProAl aTyrAspSer l l eLeuGl uArgCysMe
BstXI (2415)

2401 TGCCACAGGGGCTGACCACCTGATGGATCTGTCCACCTCATCAGAGTAGGGGTGCTGACAGCCACAATGGTGTCAAAGTCCTTCTGCCCGTTGCTCAC
101◆tGl yCysP roSer Val Val A rgl l eSer ArgAspVal Gl uAspSer TyrP roHi sArgVal Al aVal l l eThr AspPheAspLysGl nGl yAsnSer Val
StuI (2550)
Eco147I (2550)

2501 AGCAGACCCAATGGCAATGGCTTCAGCAGACAGTGCCTGCCAATGTAGGCTCAATGTGGACAGCAGAGATGATCTCCCAGTCTTGGTCTGATG
68◆Al aSer Gl y l l eAl a l l eAl aGl uAl aCysVal Thr Val A rgl y l l eTyrAl aGl ul l eHi sVal Al aSer l l e l l eGl uGl yThr LysThr A rgl l eA
XmnI (2692)

2601 GCCGCCCCGACATGGTGCTTGTGCTCATAGAGCATGGTGATCTTCTCAGTGGCGACTCCACCAGCTCCAGATCTGCTGAGAGATGTTGAAGGTCT
34◆l aAl aGl yVal Hi sHi sLysAsnAspGl uTyrLeuMet Thr l l eLysGl uThr Al aVal Gl uVal LeuGl uLeuAspGl nGl nSer l l eAsnPheThr Ly
VspI (2758)
AseI (2758)

2701 TCATGATGGCCCTCTATAGTGAGTCGTATTATACTATGCCGATATACTATGCCGATGATTAATTGTCAAACACAGCGTGGATGGCGTCTCCAGCTATCT
1◆sMet
SacI (2815)

2801 GACGGTTCACATAACGAGCTCTGCTTATATAGACCTCCCACCGTACACGCCTACCGCCATTGCGTCAATGGGGCGGAGTTGTTACGACATTTTGAAA

2901 GTCCCGTTGATTTACTAGTCAAAAACAACTCCATTGACGTCAATGGGTGGAGACTTGAAAATCCCCGTGAGTCAAACCGCTATCCACGCCATTGAT
SpeI (2913)

3000 GTACTGCCAAAACCGCATCATCATGGTAATAGCGATGACTAATACGTAGATGTACTGCCAAGTAGGAAAGTCCATAAGGTCATGTACTGGGCATAATGC
SnaBI (3041)
Eco105I (3041)

3100 CAGGCGGGCATTACCCTCATTGACGTCAATAGGGGGCTACTTGGCATATGATACACTTGATGTACTGCCAAGTGGCAGTTTACCCTAAATACTCCA
NdeI (3146)

3200 CCCATTGACGTCAATGAAAAGTCCCTATTGGCGTACTATGGGAACATACGTCATTATTGACGTCAATGGGCGGGGTCGTTGGGCGGTGAGCCAGGCGG

3300 GCCATTTACCCTAAGTTATGTAACGCCCTG CAG G TT AA TTAAGAACATGTGAGCAAAGGCCAGCAAAGGCCAGGAACCGTAAAAAGCCGCGTTGCT
SdaI (3324) PacI (3332) BspLU11I (3342)

3398 GCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCG
BspLU11I (3342)

3498 TTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCTGTTCCGACCCTGCCGTTACCGGATACCTGTCCGCTTTCTCCCTTCGGGAAGCGTGGCGTTTTCTC

3598 ATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCGTTACGCCGACCGCTGCGCCTTATC
ApaLI (3656)

3698 CGGTAACATATCGTCTTGAAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGCGGT

3798 GCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGAAAAAGAG

3898 TTGGTAGCTCTTGATCCGGCAAACAACCACCGCTGGTAGCGGTGTTTTTTTTGTTTGAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGA

3998 TCCTTTGATCTTTTCTACGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAAGGGATTTTGGTCAATGGCTAGTTAATTAACATTTAAATC AGCGGCC
PacI (4072) SwaI (4081) NotI (4091)

4098 GCAATAAAATATCTTTATTTTTCATTACATCTGTGTGTTGGTTTTTTGTGTGAATCGTAACTAACATACGCTCTCCATCAAACAAAACGAAACAAAACAA
4198 ACTAGCAAATAGGCTGTCCCGAGTGAAGTGCAGGTGCCAGAACATTTCTCTATCGAA