



**PvuI (8)** **EcoNI (97)**  
**SgfI (7)** **AgeI (90)**

1 GGATCTGCGATCGCTCCGGTGCCCGTCAGTGGGCAGAGCGCACATCGCCACAGTCCCGAGAAGTTGGGGGAGGGGTCGGCAATTGAACCCGGTGCCTA  
 101 GAGAAGGTGGCGCGGGGTAACCTGGGAAAGTGATGTCGTGTACTGGCTCCGCCCTTTTCCCGAGGGTGGGGGAGAACCCTATATAAGTGCAGTAGTCGCC

**Psp1406I (204)** **PvuII (240)**

201 GTGAACGTTCTTTTTTCGCAACGGGTTTGCCGCCAGAACACAGCTGGTGGGTAGGGATGAGGGAGGGAGGGGATTGTGATGTACAGGGGCTGCTCTGTGAG  
 301 ATCAAGGGTCTCTTAAGGGTGGGAGCTGGGGCAGGGACTACGAGAGCAGCCAGATGGGCTGAAAGTGAACTCAAGGGGTTTCTGGCACCTACCTACCTG  
 401 CTTCCCGCTGGGGGGTGGGGAGTTGGCCAGAGTCTTAAGATTGGGGCAGGGTGGAGAGGTGGGCTCTTCTGCTTCCACTCATCTTATAGCTTTCTTT

**EcoRV (540)** **NcoI (556)**  
 501 CCCAGATCCGAATTCGAGATCCAAACCAAGGAGGAAAGGATATCACAGAGGAGACCATGGAGAGCAAGGCGCTGCTCGCTGCTGCTGTGGTTCTGCG  
▶

601 TGGAGACCCGAGCCGCTCTGTGGTGTGCTGGCGATTTCTCCATCCCCCAAGCTCAGCACACAGAAAGACATACTGACAATTTGGCAAATACAAC  
1▶MetGluSerLysAlaLeuLeuAlaValAlaLeuTrpPheCysV

701 CCTTCAGATTACTTGCAGGGGACAGCGGGACCTGGACTGGCTTTGGCCCAATGCTCAGCGTGATTCTGAGGAAAGGGTATTGGTGACTGAATGCGGCGGT  
15▶alGluThrArgAlaAlaSerValGlyLeuProGlyAspPheLeuHisProProLysLeuSerThrGlnLysAspI leLeuThrI leLeuAlaAsnThrTh  
48▶rLeuGlnI leThrCysArgGlyGlnArgAspLeuAspTrpLeuTrpProAsnAlaGlnArgAspSerGluGluArgValLeuValThrGluCysGlyGly

**SalI (885)** **AatII (882)**  
 801 GGTGACAGTATCTTCTGCAAAACACTCACCATTCCAGGGTGGTTGAAATGATACTGGAGCCTACAAGTCTCGTACCGGGACGTCGACATAGCCTCCA  
82▶GlyAspSerI lePheCysLysThrLeuThrI leProArgValValGlyAsnAspThrGlyAlaTyrLysCysSerTyrArgAspValAspI leAlaSerT

901 CTGTTTATGTCTATGTTTCGAGATTACAGATCACCATTTCATCGCCTCTGTACGTGACCAGCATGGCATCGTGTACATCACCGAGAACAAGAACAACAACTGT  
115▶hrValTyrValTyrValArgAspTyrArgSerProPheI leAlaSerValSerAspGlnHisGlyI leValTyrI leThrGluAsnLysAsnLysThrVa

**BspEI (1076)**  
 1001 GGTGATCCCCTGCCGAGGGTCGATTTCAAACCTCAATGTGTCTTTTGGCGTAGGTATCCAGAAAAGAGATTTGTTCCGGATGAAACAGAAATTTCTGG  
148▶IValI leProCysArgGlySerI leSerAsnLeuAsnValSerLeuCysAlaArgTyrProGluLysArgPheValProAspGlyAsnArgI leSerTrp

**NaeI (1146)**  
 1101 GACAGCGAGATAGGCTTACTCTCCCGATTACATGATCAGCTATGCCGGCATGGTCTTCTGTGAGCAAAGATCAATGATGAAACCTATCAGTCTATCA  
182▶AspSerGluI leGlyPheThrLeuProSerTyrMetI leSerTyrAlaGlyMetValPheCysGluAlaLysI leAsnAspGluThrTyrGlnSerI leM

1201 TGTACATAGTTGTGGTGTAGGATATAGGATTTATGATGTGATTCTGAGCCCCCGCATGAAATTGAGCTATCTGCCGGAGAAAACTTGTCTTAAATTTG  
215▶etTyrI leValValValValGlyTyrArgI leTyrAspValI leLeuSerProProHisGluI leGluLeuSerAlaGlyGluLysLeuValLeuAsnCy

1301 TACAGCGAACAAGAGCTCAATGTGGGGCTGATTTACCTGGCACTCTCCACCTCAAAGTCTCATCATAAGAAGATTGAAACCGGGATGTGAAACCC  
248▶sThrAlaArgThrGluLeuAsnValGlyLeuAspPheThrTrpHisSerProProSerLysSerHisHisLysLysI leValAsnArgAspValLysPro

1401 TTTCTGGACTGTGGCGAAGATGTTTTGAGCACCTTGACAATAGAAAGTGTGACCAAGAGTGACCAAGGGAATACACCTGTGTAGCGTCCAGTGGAC  
282▶PheProGlyThrValAlaLysMetPheLeuSerThrLeuThrI leGluSerValThrLysSerAspGlnGlyGluTyrThrCysValAlaSerSerGlyA

1501 GGATGATCAAGAGAAATAGAACATTTGTCGGAGTTCACACAAGCCTTTTATTGCTTTCGGTAGTGGGATGAAATCTTTGGTGGAAAGCCACAGTGGGCG  
315▶rgMetI leLysArgAsnArgThrPheValArgValHisThrLysProPheI leAlaPheGlySerGlyMetLysSerLeuValGluAlaThrValGlySe

**EcoRV (1644)**  
 1601 TCAAGTCCGAATCCCTGTGAAGTATCTCAGTTACCCAGCTCCTGATATCAAATGGTACAGAAATGGAAGGCCATTGAGTCCAACCTACACAATGATTGTT  
348▶rGlnValArgI leProValLysTyrLeuSerTyrProAlaProAspI leLysTrpTyrArgAsnGlyArgProI leGluSerAsnTyrThrMetI leVal

**BstXI (1771)**  
 1701 GCGGATGAACCTACCATCATGGAAGTACTGAAAGAGATGCAGGAACTACACGGTCATCCTCACCAACCCATTTCATGAGAAACAGAGCCACATGG  
382▶GlyAspGluLeuThrI leMetGluValThrGluArgAspAlaGlyAsnTyrThrValI leLeuThrAsnProI leSerMetGluLysGlnSerHisMetV

1801 TCTCTCTGTTGTGAATGTCCACCCAGATCGGTGAGAAAGCCTTGATCTCGCCTATGGATTCTACCAGTATGGGACCATGCAGACATTGACATGCAC  
415▶alSerLeuValValAsnValProProGlnI leGlyGluLysAlaLeuI leSerProMetAspSerTyrGlnTyrGlyThrMetGlnThrLeuThrCysTh

1901 AGTCTACGCCAACCCCTCCCTGCACCACATCCAGTGGTACTGGCAGCTAGAAGAAGCCTGCTCCTACAGACCCGGCCAAACAAGCCGATGCTTGTA  
448▶rValTyrAlaAsnProProLeuHisHisI leGlnTrpTyrTrpGlnLeuGluGluAlaCysSerTyrArgProGlyGlnThrSerProTyrAlaCysLys

2001 GAATGGAGACACGTGGAGGATTTCCAGGGGGAAACAAGATCGAAGTCACCAAAAACCAATATGCCTGATTGAAGGAAAAACAAAACCTGTAAGTACGG  
482▶GluTrpArgHisValGluAspPheGlnGlyGlyAsnLysI leGluValThrLysAsnGlnTyrAlaLeuI leGluGlyLysAsnLysThrValSerThrL

2101 TGGTCAATCAAGCTGCCAACGTGTACAGCTGTGACAAATGTGAAGCCATCAACAAGCGGGACGAGGAGAGAGGGTCACTCCTTCCATGTGATCAGGGG  
515▶euValI leGlnAlaAlaAsnValSerAlaLeuTyrLysCysGluAlaI leAsnLysAlaGlyArgGlyGluArgValI leSerPheHisValI leArgGI

**PstI (2266)** **ApaLI (2261)**  
 2201 TCCTGAAATTAAGTGTGCAACCTGCTGCCAGCAACTGAGCAGGAGAGTGTGCCCTGTTGTGCACTGCAGACAGAAATACGTTTGAACCTCACGTGG

548▶yProGluI leThrValGlnProAlaAlaGlnProThrGluGlnGluSerValSerLeuLeuCysThrAlaAspArgAsnThrPheGluAsnLeuThrTrp

**HindIII (2304)**  
2301 TACAAGCTTGGCTCACAGGCAACATCGGTCCACATGGGCGAATCACTCACACCAGTTTGAAGAAGCTTGGATGCTCTTTGGAAACTGAATGGCACCATGT

582▶ TyrLysLeuGlySerGlnAlaThrSerValHisMetGlyGluSerLeuThrProValCysLysAsnLeuAspAlaLeuTrpLysLeuAsnGlyThrMetP  
PstI (2451)

2401 TTTCTAACAGCACAAATGACATCTTGATTGTGCATTTTCAAGATGCCTCTCTGCAGGACCAAGGCGACTATGTTTCTCTGCTCAAGATAAGAAGACCAA

615▶ heSerAsnSerThrAsnAspI leLeuI leValAlaPheGlnAsnAlaSerLeuGlnAspGlnGlyAspTyrValCysSerAlaGlnAspLysLysThrLy  
2501 GAAAAGACATTGCCTGGTCAAACAGCTCATCATCTAGAGCGCATGGCACCATGATCACCGAAATCTGGAGAATCAGACAACAACCATTTGGCGAGACC

648▶ sLysArgHisCysLeuValLysGlnLeuI leI leLeuGluArgMetAlaProMetI leThrGlyAsnLeuGluAsnGlnThrThrThrl leGlyGluThr  
2601 ATTGAAGTGACTTGCCAGCATCTGAAATCCTACCCACACATTACATGGTTCAAAGACAACGAGACCCTGGTAGAAGATTGAGCATTGACTGAGAG

682▶ I leGluValThrCysProAlaSerGlyAsnProThrProHisI leThrTrpPheLysAspAsnGluThrLeuValGluAspSerGlyI leValLeuArgA  
BsrBI (2791)

2701 ATGGGAACCGGAACCTGACTATCCGAGGGTGGGAAGGAGGATGGAGGCCTACACCTGCCAGGCTGCAATGCTCTGGCTGTGCAAGAGCGGAGAC

715▶ spGlyAsnArgAsnLeuThrl leArgArgValArgLysGluAspGlyGlyLeuTyrThrCysGlnAlaCysAsnValLeuGlyCysAlaArgAlaGluTh  
NheI (2831)

2801 GCTCTTCATAATAGAAGGTGCCTAGAATTCTGCTAGCTCGACATGATAAGATACATTGATGAGTTTGGACAAACCACAACCTAGAATGCAGTGAAAAAATG

748▶ rLeuPheI leI leGluGlyAla•••

**HpaI (2994)**  
2901 CTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAAACCATTATAAGCTGCAATAAACAAGTTAACA

DraI (3055) DraI (3093) SwaI (3092)  
3001 ACAACAATTGCATTCATTTTATGTTTCAGGTTTCAGGGGAGGTGTGGGAGGTTTTTAAAGCAAGTAAACCTCTACAAATGTGGTAGATCATTTAAATG

PacI (3101) BspLU11I (3111)  
3101 TTAATTAAAGACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCTTGTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGC

3201 ATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTTCCCTGGAAGCTCCCTCGTGGCTCTCCTGT

3301 TCCGACCTGCCGCTTACCGGATACCTGTCCGCTTTCTCCCTTCGGAAGCGTGGCGTTTTCTCAATGCTCAGCTGTAGGTATCTCAGTTCGGTGTAG

ApaLI (3425)  
3401 GTCGTTGCTCCAAGCTGGGCTGTGTGCACGAACCCCGTTTCAGCCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGAC

3501 ACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGCGGTGCTACAGAGTCTTGAAGTGGTGGCCTAACTACGG

3601 CTACACTAGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAAACAAACCACCGCT

3701 GGTAGCGGTGGTTTTTTTTGTTTGAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGTCTGACGCTCAGT

PacI (3841)  
3801 GGAACGAAAACCTCACGTTAAGGGATTTTGGTCATGGCTAGTTAATTAAGCTGTACACTGTGGAATGTGTGTGAGTTAGGGTGTGGAAGTCCCAGGCTC

NsiI (3926) NsiI (3998)  
3901 CCCAGCAGGCAGAAGTATGCAAAGCATGCATCTCAATTAGTCAGCAACCAGGTGTGAAAGTCCCCAGGCTCCCCAGCAGGCAGAAGTATGCAAAGCATG

NcoI (4087)  
4001 CATCTCAATTAGTCAGCAACCATAGTCCCGCCCTAACTCCGCCATCCCGCCCTAACTCCGCCAGTTCGCCCCATTCTCCGCCCATGGCTGACTAA

AvrII (4180)  
4101 TTTTTTTTATTTATGAGAGCCGAGGCCGCTCTGCTCTGAGCTATTCCAGAAGTAGTGAGGAGGCTTTTTTGGAGGCTAGGCTTTTGCAAAAAGCT

SmaI (4201) AseI (4250)  
4201 CCCGGGAGCTTGATATACCATTTTCGGATCTGATcagCACGTGTTGACAATTAATCATCGGCATAGTATATCGGCATAGTATAATACGACAAGGTGAGGA

XmnI (4311) BspHI (4307)  
4301 ACTAAATCATGAAGACCTTCAACATCTCTCAGCAGGATCTGGAGCTGGTGGAGGTCGCCACTGAGAAGATCACCATGCTCTATGAGGACAACAAGCACCA

1▶ MetLysThrPheAsnI leSerGlnGlnAspLeuGluLeuValGluValAlaThrGluLysI leThrMetLeuTyrGluAspAsnLysHisHi  
4401 TGTCCGGGCGCCATCAGGACCAAGACTGGGAGATCATCTCTGCTGTCCACATTGAGGCTACATTGGCAGGGTCACTGTCTGTGCTGAAGCCATTGCC

31▶ sValGlyAlaAlaI leArgThrLysThrGlyGluI leI leSerAlaValHisI leGluAlaTyrI leGlyArgValThrValCysAlaGluAlaI leAla  
BstXI (4586)

4501 ATGGGTCTGCTGTGAGCAACGGGCAGAAGGACTTTGACACCATTGTGGCTGTGAGCACCCTACTCTGATGAGGTGGACAGATCCATCAGGGTGGTCA

65▶ I leGlySerAlaValSerAsnGlyGlnLysAspPheAspThrl leValAlaValArgHisProTyrSerAspGluValAspArgSerI leArgValValS  
4601 GCCCTGTGGCATGTGCAGAGCTCATCTCTGACTATGCTCTGACTGCTTTGTGCTCATTGAGATGAATGGCAAGCTGGTCAAACACCATTGAGGA

98▶ erProCysGlyMetCysArgGluLeuI leSerAspTyrAlaProAspCysPheValLeuI leGluMetAsnGlyLysLeuValLysThrThrl leGluGI  
Bsp120I (4748)

4701 ACTCATCCCCCTCAAGTACACCAGGAACCTAAACCTGAATTCGCTAGAGGGCCCTATTCTATAGTGTACCTAAATGCTAGAGCTCGCTGATCAGCCTCGA

131▶ uLeuI leProLeuLysTyrThrArgAsn••••  
4801 CTGTGCCTTCTAGTTGCCAGCCATCTGTTGTTTGCCTCCCGGTCCTTCTTGACCCTGGAAGGTGCCACTCCACTGTCCTTTCCTAATAAAATGA

FspI (5000)  
4901 GGAAATTCATCGCATTGTCTGAGTAGGTGTCATTCTATTCTGGGGGTGGGGTGGGGCAGGACAGCAAGGGGAGGATTGGGAAGACAATAGCAGGCAT

**EagI (5023)**

**NotI (5022)**

BsrBI (5020)

Bsp120I (5006) **XhoI (5017)**

5001 GCGCAGGGCCCAATTGCTCGAGCGGCCGCAATAAAATATCTTTATTTTCATTACATCTGTGTGTTGGTTTTTGTGTGAATCGTAACTAACATACGCTCT  
5101 CCATCAAAACAAAACGAAACAAAACAACTAGCAAATAGGCTGTCCCAGTGCAAGTGCAGGTGCCAGAACATTTCTCTATCGAA