



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

1 GGATCTGCGATCGCTCCGGTGCCCGTCAGTGGCAGAGCGCACATCGCCACAGTCCCGGAGAAGTTGGGGGAGGGGTGGCAATTGAACGGGTGCCTA  
101 GAGAAAGTGGCGGGGTAACGGAAAGTGATGTCGTGTACTGGCTCCGCCTTTTCCGAGGGTGGGGGAGAACCCTATATAAGTGCAGTAGTCGCC

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

201 GTGAACGTTCTTTTTTCGCAACGGGTTTGCCGCCAGAACACAGCTGAAGCTTCGAGGGCTCGCATCTCTCTTACCGCCGCCGCCCTACCTGAGGCC  
301 GCCATCCACGCCGGTTGAGTGCCTTCTGCCGCTCCCGCCTGTGGTGCTCTGAACTGCGTCCGCCGTCTAGGTAAGTTTAAAGCTCAGGTCGAGACC

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

401 GGGCCTTTGTCCGGCGCTCCCTTGAGCCTACCTAGACTCAGCCGGCTCTCCACGCTTTGCTGACCCTGCTTGTCAACTCTACGTCTTTGTTTCGTTT

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**KasI (535)**
**AgeI (552)**
**BspHI (560)**

501 TCTGTTCTGCGCCGTTACAGATCCAAGCTGTGACCGCGCCTACTCTGAGATCACCGGTCATCATGAAGTTTCCCTGGAAAGTCTTCAAGACCACCTTCT  
1▶MetLysPheP roTrpLysVal PheLysThr Thr LeuLe

**MscI (669)**  
**BalI (669)**  
**Neol (666)**

601 GCTTCTTCTGCTCTCTCACTCATTGGCCTCTGTGCCCTCTGAGACCAGCCAGGTGACAGCTACTCCCATGGCCAAAGCTGTTTAGGGTGTGTGGTACTG  
13▶uLeuLeuLeuLeuSer Hi sSer LeuAl aSer Val P roSer Gl uAspGl nP roGl yAspSer TyrSer Hi sGl yGl nSer CysLeuGl yCysVal Val Leu  
701 GTATCTGTGATTGAGCAACTGGCTGAAGTTCACAACCTTTCAGTCCAGTGGCGATGGAGAGACTCTGCAGCTACCTGCCTGAAAAGCTGTTCTTAAAA  
47▶Val Ser Val I l eGl uGl nLeuAl aGl uVal Hi sAsnSer Ser Val Gl nVal I Al aMetGl uArgLeuCysSer TyrLeuP roGl uLysLeuPheLeuLysT  
801 CCGCTGCTATTTCTGGTTCAGACATTTGGCTCAGACATCAAAAACCTACTCGATGAAGCTATGAAGGCTGATGTGGTGTGCTATGCTCTGGAATTTTG  
80▶hrAl aCysTyrPheLeuVal Gl nThr PheGl ySerAspI l eI l eLysLeuLeuAspGl uAl aMetLysAl aAspVal Val CysTyrAl aLeuGl uPheCy

**StuI (950)**
**Eco147I (950)**
**EcoO109I (994)**

901 CAAGCGGGTGTGTCCAACCACAGTGTCTCTACCCACTTCCCAGGAGGCTGGGAGTCTGCACTGGAGAAGGCGAGACAAGTCCCTCAGGAGGTCC  
113▶sLysArgGl yAl aVal Gl nP roGl nCysHi sLeuTyrP roLeuP roGl nGl uAl aTrpGl uSer Al aLeuGl uLysAl aArgGl nVal LeuArgArgSer

**BglII (1058)**

1001 TCTACCATGAAATATCGCAGAAGTGGCTGTAACATTTGTTCCCTACCATTTTTGACCAAGATCTGCCAGAAAATTGAATTATCTATAAAGAAGGCCGTGC  
147▶Ser Thr MetLysTyrArgArgSer Gl yArgAsnI l eCysSer LeuP roPheLeuThr LysI l eCysGl nLysI l eGl uLeuSer I l eLysLysAl aVal P  
1101 CATTCAAAGACGTAGATTAGACAAGCACAGTGTTCACCAACGCTGCGGGGCTACCCTGGCGAGGGCGTGACTGTAATGACAGTGACAAGACAGTGT  
180▶r oPheLysAspVal AspSerAspLysHi sSer Val PheP roThr LeuArgGl yTyrHi sTrpArgGl yArgAspCysAsnAspSerAspLysThr Val Ty

**EcoRV (1225)**  
**Eco32I (1225)**  
**XmaI (1200)**
**BsiBI (1225)**
**NdeI (1286)**  
**SmaI (1200)**
**BsaBI (1225)**
**EcoRI (1280)**

1201 CCCGGCAGAAAGCCAGACAACCTGGGATATCCATCAGGACTCCAAGTGAATGGCATCTGGGGTATTGATCCGAAAGATGGAATTCCATATGAGAAGAAA  
213▶r P roGl yArgArgP roAspAsnTrpAspI l eHi sGl nAspSerAsnCysAsnGl yI l eTrpGl yI l eAspProLysAspGl yI l eP roTyrGl uLysLys

**PvuII (1346)**

1301 TTCTGTGAAGTTCACAGCCAGGGGAATCATTTTGTGGGAGACTCAGTGGGGCTCATTTTACATCCCCCTGAATGGCTGACAGCTTCACAGATGT  
247▶PheCysGl uGl ySer Gl nP roArgGl yI l eI l eLeuLeuGl yAspSer Al aGl yAl aHi sPheHi sI l eP roP roGl uTrpLeuThr Al aSer Gl nMetS  
1401 CTGGAACCTCTTCTCAACCTGCCGTCGCCCTTACCAGTACGCTCACTGGCCCAACTCTCTGGTGAATGGATTTCTGGACTCCACGAGTGGAAAT  
280▶er Val AsnSer PheLeuAsnLeuP roSer Al aLeuThrAspGl uLeuAsnTrpP roGl nLeuSer Gl yVal Thr Gl yPheLeuAspSer Thr Ser Gl yI l  
1501 TGAAGAAAATCCATTTACCATCGTTTGAGAAAGAAAACATTGCAATCACAGAGACTATCAGAGTATCTCAAAAAATGGTGCATCTCCAGAAATCTG  
313▶eGl uGl uLysSer I l eTyrHi sArgLeuArgLysArgAsnHi sCysAsnHi sArgAspTyrGl nSer I l eSer LysAsnGl yAl aSer Ser ArgAsnLeu

**BstBI (1689)**  
**Bsp119I (1689)**  
**AsuII (1689)**

**HindIII (1614)**

1601 AAGATTTTATTGAAAGCTTGTCTAGGAACCAGGCATCAGACCATCCAGCATTGTCTTTATGCCATGATTGAAACGATGTTTGTAAATTCGAAAGCTG  
347▶LysAsnPheI l eGl uSer LeuSer ArgAsnGl nAl aSerAspHi sP roAl aI l eVal LeuTyrAl aMetI l eGl yAsnAspVal CysAsnSer LysAl aA  
1701 ACACAGTACCAGAAATGACCACTCTGAACAAATGTATGCCAAGTCTATGAGACTCTGACGCATCTAAATCTCACCTGCCAATGGCAGCCACGTTAT  
380▶spThr Val P roGl uMetThr Thr P roGl uGl nMetTyr Al aAsnVal MetGl nThr LeuThr Hi sLeuAsnSer Hi sLeuP roAsnGl ySer Hi sVal I l

**AvrII (1860)**

1801 TTTATACGCTTACCAGATGGAACCTTTCTCTGGGATAGCTTGCAACAACCGATAACCACCCCTAGGCCAGCTAAATAAAGATGTGACCTATGCACAGTTC  
413▶eLeuTyrGl yLeuP roAspGl yThr PheLeuTrpAspSer LeuHi sAsnArgTyrHi sP roLeuGl yGl nLeuAsnLysAspVal Thr TyrAl aGl nPhe

**BspEI (1964)**

1901 TTCTCCTTTCTAAGATGCCTGCAGCTCAATCCCTGTAACGGCTGGATGTCTTCCAACAAGACCTCCGGACTCTCACTCAGAGAGAGCCGAACAACTCT  
447▶PheSer PheLeuArgCysLeuGl nLeuAsnP roCysAsnGl yTrpMetSer SerAsnLysThr LeuArgThr LeuThr Ser Gl uArgAl aGl uGl nLeuS  
2001 CCAATACACTGAAAAAATGCAACCACGAGACGTTTGCAAACCTT GATCTTTTCTACGTGGATTTTGCCCTCCATGAAATAATAGAGGACTGGCAGAA  
480▶erAsnThr LeuLysLysI l eAl aThr Thr Gl uThr PheAl aAsnPheAspLeuPheTyrVal AspPheAl aPheHi sGl uI l eI l eGl uAspTrpGl nLys

**NcoI (2113)**

2101 AAGAGGTGGACAGCCATGGCAGCTTATTGAACCTGTGGATGGATTCCACCCCAATGAGGTGGCTTCACTTCTGCAAGCAAATCGTGTCTGGGAAAAGATA  
513▶sArgGl yGl nP roTrpGl nLeuI l eGl uP roVal AspGl yPheHi sP roAsnGl uVal I Al aSer LeuLeuGl nAl aAsnArgVal TrpGl uLysI l e

**SacII (2291)**

2201 CAGCTTCAATGGCCTCATGTCTGGAAAGGAGAATCCATTCAACTCTCAGATTGAAGAGGTGTTGGAGACCAAGGAGGACTGAGTCTCCGCGGAAG  
547▶Gl nLeuGl nTrpP roHi sVal LeuGl yLysGl uAsnP roPheAsnSer Gl nI l eGl uGl uVal PheGl yAspGl nGl yGl yHi s •••

MscI (2347)  
 BalI (2347)  
**NheI (2341)**

2301 GCGCATCACTGGGGGAGAGAAAGGTGGATAAACCTCCACGCTAGCTGGCAGACATGATAAGATACATTGATGAGTTTGGACAAACCACAAC TAGAAT

HpaI (2479) MfeI (2490)

2401 GCAGTGAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAACAAGTTAACAACAAC AATTGCATT

EcoRI (2575)

2501 CATT TTTATGTTTCAGGTT CAGGGGAGGTGTGGGAGGTTTTTAAAGCAAGTAAACCTCTACAAATGTGGTATGGAATTCTAAAATACAGCATAGCAA

2601 ACTTTAACCTCCAATCAAGCCTCTACTTGAATCCTTTCTGAGGGATGAATAAGGCATAGGCATCAGGGCTGTTGCCAATGTGCATTAGCTGTTTGA

2701 GCCTCACCTTCTTTCATGGAGTTAAGATATAGTGATTTTCCCAAGGTTGAACTAGCTCTTCATTTCTTTATGTTTTAAATGCACTGACCTCCACAT

SspI (2814) SwaI (2828) EcoO109I (2889)

2801 TCCCTTTTTAGTAAAATATTCAGAAATAATTTAAATACATCATTGCAATGAAAATAAATGTTTTTTATTAGGCAGAATCCAGATGCTCAAGGCCCTTCAT

2901 AATATCCCCAGTTTAGTAGTTGGACTTAGGGAACAAAGAACCTTTAATAGAAATTGGACAGCAAGAAAGCGAGCTTCTAGCTTTAGTTCCTGGTGTAC

141 •••AsnArgThr TyrL

3001 TTGAGGGGATGAGTTCCTCAATGGTGGTTTTGACCAGCTTGCCATTCATCTCAATGAGCACAAGCAGTCAGGAGCATAGTCAGAGATGAGCTCTCTGC

135 LysLeuProIleLeuGluGluIleThrThrLysValLeuLysGlyAsnMetGluIleLeuValPheCysAspProAlaTyrAspSerIleLeuGluuArgCys

3101 ACATGCCACAGGGGCTGACCACCCTGATGGATCTGTCCACCTCATCAGAGTAGGGTGCTGACAGCCACAATGGTGTCAAAGCTCTTCTGCCGTTGCT

102 MetGlyCysProSerValValArgIleSerArgAspValGluAspSerTyrProHisArgValAlaValIleThrAspPheAspLysGlnGlyAsnSer

StuI (3253)  
Eco147I (3253)

3201 CACAGCAGACCAATGGCAATGGCTTCAGCACAGACAGTGACCCTGCCAATGTAGGCCTCAATGTGGACAGCAGAGATGATCTCCCCAGTCTTGGTCCTG

69 ValAlaSerGlyIleAlaIleAlaGluAlaCysValThrValArgGlyIleTyrAlaGluIleHisValAlaSerIleIleGluGlyThrLysThrArgI

3301 ATGCCC GCCCGACATGGTGCTTGTCTCATAGAGCATGGTGATCTTCTCAGTGGCGACCTCCACAGCTCCAGATCCTGCTGAGAGATGTTGAAGG

35 IleAlaAlaGlyValHisHisLysAsnAspGluTyrLeuMetThrIleLysGluThrAlaValGluValLeuGluLeuAspGlnGlnSerIleAsnPheTh

VspI (3461)  
AseI (3461)

3401 TCTTCATGATGGCCCTCTATAGTGAGTCGATTATACTATGCCGATATACTATGCCGATGATTAATTGTCAAACACAGCGTGATGGCGTCTCCAGCTTA

2 LysMet

3501 TCTGACGGTTCACATAAACGAGCTCTGCTTATATAGACCTCCACCCTACACGCCTACCGCCATTTGCGTCAATGGGGCGGAGTTGTTACGACATTTTGG

SpeI (3616)

3601 AAAGTCCCGTTGATTTACTAGTCAAAAACAACTCCATTGACGTCAATGGGGTGAGACTTGAAAATCCCCGTGAGTCAAACCGCTATCCACGCCATT

SnaBI (3744)  
Eco105I (3744)

3700 GATGTA CTGCCAAAACCGCATCATCATGGTAATAGCGATGACTAATACGTAGATGTACTGCCAAGTAGGAAAGTCCATAAGGTCATGTACTGGGCATAA

NdeI (3849)

3800 TGCCAGGCGGCCATTTACCGTCATTGACGTCAATAGGGGGCGTACTTGGCATATGATACACTTGATGTACTGCCAAGTGGGCAGTTTACCGTAAATACT

3900 CCACCCATTGACGTCAATGAAAAGTCCCTATTGGCGTTACTATGGGAACATACGTCATTATTGACGTCAATGGCGGGGGTCTGTTGGCGGTCAGCCAGG

SdaI (4027) PacI (4035) BspLU11I (4045)

4000 CGGGCCATTTACCGTAAGTTATGTAACGCCCTGCAGGTTAA TTAAGAACATGTGAGCAAAAAGCCAGCAAAAAGGCCAGGAACCGTAAAAAGGCCGCTT

4098 GCTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAAACCCGACAGGACTATAAAGATACCAG

4198 GCGTTTTCCCCTGGAAGCTCCCTCGTGGCTCTCTGTCCGACCCTGCCGTTACCGGATACCTGTCCGCTTTCTCCCTTCGGAAGCGTGGCGCTTT

ApaLI (4359)

4298 CTCATAGCTCAGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTGCTCCAAGCTGGGCTGTGTGCACGAACCCCCGTTAGCCCGACCGCTGCGCCTT

4398 ATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGC

4498 GGTGCTACAGAGTCTTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGAAAAA

4598 GAGTTGGTAGCTCTTGATCCGGCAAACAAACCCGCTGGTAGCGGTGTTTTTTTTGTTTGAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGA

EagI (4795)  
PacI (4775) SwaI (4784) NotI (4794)

4698 AGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAAACGAAAACCTCACGTTAAGGGATTTTGGTCATGGCTAGTTAATTAACATTTAAATCAGCC

4798 GCCGCAATAAAATATCTTTATTTTTCATTACATCTGTGTGTTGTTTTTTGTGTGAATCGTAACTAACATACGCTCTCCATCAAAAACAAACGAAACAAAA

4898 CAAACTAGCAAAATAGGCTGTCCCAGTGCAAGTGCAGGTGCCAGAACATTTCTCTATCGAA