



Bsp120I (8)
 EcoO109I (8)
PstI (7)
SdaI (7) **SpeI (14)** **Acc65I (23)**

1 CCTGCAGGGCCCACTAGTTGAGGTACCTGGTGTAGTTTTATTTCAGGTTTTATGCTGTCATTTCTGTAATGCTAAGGACTTAGGCATAACTGAATTT

101 TCTATTTTCCACTTCTTTTCTGGTGTGTGTATATATATATGTATATATACACACACACATgTACATATATATATTTTTTAGTATCTCACCTCACATG

BsrGI (162)

201 CTCTCCCTGAGCACTACCCATGATAGATGTTAAACAAAAGCAAAGATGAAATTCACACTGTCAAAATCTCCCTTCCATCTAATTAATTCCTCATCCAAC

AseI (285)

301 TATGTTCCAAAACGAGAATAGAAAATTAGCCCAATAAGCCAGGCAACTGAAAAGTAAATGCTATGTTGTACTTTGATCCATGGTCAACTCATAATC

NcoI (381)

401 TTGAAAAGTGGACAGAAAAGACAAAAGAGTGAACCTTAAAACCTCGAATTTATTTACCAGTATCTCCTATGAAGGGCTAGTAACAAAATAATCCACGG

501 ATCAGGGAGAGAAATGCCTTAAGGCATACGTTTTGGACATTTAGCGTCCCTGCAAATCTGGCCATCGCCGCTTCTTTGTCCATCAGAAGGCAGGAAAC

MseI (563)

601 TTTATATTGGTGACCCGTGGAGCTCACATTAACATTTACAGGGTAACTGCTTAGGACCAGTATTATGAGGAGAATTTACCTTTCCcCCTCTCTTTCCA

BstEII (610) **SacI (625)**

701 AGAAACAAGGAGGGGTGAAGGTACGGAGAACAGTATTTCTTCTGTTGAAAGCAACTTAGCTACAAAGATAAATTACAGCTATGTACTGAAGGTAGCT

BsrGI (783)

801 ATTTCAATCCACAAAATAAGAGTTTTTAAAAAGCTATGTATGTATGTCTGCATATAGAGCAGATATACAGCCTATTAAGCGTCGCTACTAAACATAA

901 AACATGTCAGCCTTTCTTAACCTTACTCGCCAGCTGTGCCGACGTGACTTCTCGACCTCTAAAGACGTACAGACCAGACACGGCGCGGGCGCGG

1001 GAGAGGGGATTCCTGCGCCCCGGACCTCAGGGCCGCTCAGATTCTGGAGAGGAAGCAAGTGTCTTCTGCCCTCCCCGGTATCCCATCCAAGGGC

1101 ATCAGTCCAGAAGTGGCTCTCGGAAGCGCTCGGGCAAAGACTGCGAAGAAGAAAAGACATCTGGCGGAAACCTGTGCGCTGGGGCGGTGGAACCTGGGG

Eco47III (1128)

1201 AGGAGAGGGAGGGATCAGACAGGAGAGTGGGGACTACCCCTCTGCTCCAAATTGGGGCAGCTTCTGGGTTTCCGATTTTCTATTTCCGTGGGTAAA

1301 AAACCTGCCCCACCAGGGCTTACGCAATTTTTTAAAGGGAGAGGAGGAAAATTTGTGGGGGTACGAAAAGCGGAAAGAAACAGTCATTTCTGTCA

1401 CATGGGCTTGGTTTTAGTCTTATAAAAAGGAAGTTCTCTCGGTTAGCGACCAATTGTCATACGACTTGACAGTGCAGTGCAGGAGCAGTCCAGGAAC

MfeI (1454)

1501 CCTCAGCAGCGCTCCTCAGCTCCACAGCCAGACGCCCTCAGACAGCAAAGCTACCCCGCGCCGCGCCCTGCCGCGGTgCATGAGCGGTTCTC

BspHI (1586)

1600 ATCATCATCATCATGGTATGGCTAGCATGACTGGTGGACAGCAAATGGGTGGGATCTGTACGACGATGACGATAAGGTACCTAAGGATCAGCTTGG

NheI (1624) 1▶MetSerGlySerH
Acc65I (1680)

5▶ isHisHisHisHisHisGlyMetAlaSerMetThrGlyGlyGlnGlnMetGlyArgAspLeuTyrAspAspAspAspLysValProLysAspGlnLeuGI

1700 AGTTGATCCCGTCGTTTTACAACGTCGTGACTGGGAAAACCTGGCGTTACCAACTTAATCGCCTTGACGACATCCCCCTTTCGCCAGCTGGCGTAAT

38▶ yValAspProValValLeuGlnArgArgAspTrpGluAsnProGlyValThrGlnLeuAsnArgLeuAlaAlaHisProProPheAlaSerTrpArgAsn

FspI (1840)

1800 AGCGAAGAGGCCCGACCGATCGCCCTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGCTTTCCTGTTTCCGGCACCAGAAGCGGTGCCGAAA

72▶ SerGluGluAlaArgThrAspArgProSerGlnGlnLeuArgSerLeuAsnGlyGluTrpArgPheAlaTrpPheProAlaProGluAlaValProGluS

1900 GCTGGCTGGAGTGCATCTTCTGAGGCCGATACTGTCTGCTCCCTCAAACCTGGCAGATGACGGTTACGATGCGCCATCTACACCAACGTAACTA

105▶ erTrpLeuGluCysAspLeuProGluAlaAspThrValValValProSerAsnTrpGlnMetHisGlyTyrAspAlaProl leTyrThrAsnValThrTy

2000 TCCATTACGGTCAATCCGCCGTTTGTCCACGAGAAATCCGACGGTTGTTACTCGCTCACATTTAATGTTGATGAAAGCTGGCTACAGGAAGGCCAG

138▶ rProI leThrValAsnProProPheValProThrGluAsnProThrGlyCysTyrSerLeuThrPheAsnValAspGluSerTrpLeuGlnGluGlyGln

2100 ACGCGAATTATTTTATGATGGCGTTAACTCGGCTTTCATCTGTGGTGAACGGCGCTGGGTGCGTTACGGCCAGGACAGTCTTTCGGCTGAATTTG

172▶ ThrArgI leI lePheAspGlyValAsnSerAlaPheHisLeuTrpCysAsnGlyArgTrpValGlyTyrGlyGlnAspSerArgLeuProSerGluPheA

2200 ACCTGAGCGCATTTTTACGCGCCGGAGAAAACCGCTCGCGGTGATGGTGTCTGCGTTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGAT

205▶ spLeuSerAlaPheLeuArgAlaGlyGluAsnArgLeuAlaValMetValLeuArgTrpSerAspGlySerTyrLeuGluAspGlnAspMetTrpArgMe

AatII (2321)

2300 GAGCGGCATTTCCGTGACGTCTGTTGCTGCATAAACCGACTACACAAATCAGCGATTTCCATGTTGCCACTCGCTTAAATGATGATTTACGCCGCGCT

238▶ tSerGlyI lePheArgAspValSerLeuLeuHisLysProThrThrGlnI leSerAspPheHisValAlaThrArgPheAsnAspAspPheSerArgAla

2400 GACTGGAGGCTGAAGTTCAGATGTGGCGGAGTGGGTGACTACCTACGGTAACAGTTTCTTTATGGCAGGGTGAACCGCAGGTCGCCAGCGGCCCG

272▶ ValLeuGluAlaGluValGlnMetCysGlyGluLeuArgAspTyrLeuArgValThrValSerLeuTrpGlnGlyGluThrGlnValAlaSerGlyThrA

ClaI (2522)

2500 CGCCTTTCGGCGTGAATTATCGATGAGCGTGGTGTATGCCGATCGCGTACACTACGTCTGAACGTCGAAAACCCGAACTGTGGAGCGCCGAAAT

305▶ laProPheGlyGlyGluI leI leAspGluArgGlyGlyTyrAlaAspArgValThrLeuArgLeuAsnValGluAsnProLysLeuTrpSerAlaGluI I
2600 CCCGAATCTCTATCGTGGCGTGGTGAAGTGCACACCCGCCGACGCGCTGATTGAAGCAGAAGCCTGCGATGTCGGTTTCCGCGAGGTGCGGATTGAA

338▶ eProAsnLeuTyrArgAlaValValGluLeuHisThrAlaAspGlyThrLeuI leGluAlaGluAlaCysAspValGlyPheArgGluValArgI leGlu
2700 AATGGTCTGCTGCTGCTGAACGGCAAGCCGTTGCTGATTCGAGGCGTTAACCGTACGAGCATCATCTCTGCATGGTCAGGTCATGGATGAGCAGACGA

372▶ AsnGlyLeuLeuLeuLeuAsnGlyLysProLeuLeuI leArgGlyValAsnArgHisGluHisHisProLeuHisGlyGlnValMetAspGluGlnThrM
2800 TGGTGCAGGATATCCTGCTGATGAAGCAGAACAACCTTAAACGCCGTGCGCTGTTCCGATTATCCGAACCATCCGCTGTGGTACACGCTGTGCGACCGCTA
EcoRV (2811) DraIII (2888)

405▶ etValGlnAspI leLeuLeuMetLysGlnAsnAsnPheAsnAlaValArgCysSerHisTyrProAsnHisProLeuTrpTyrThrLeuCysAspArgTy
2900 CGGCCTGTATGTGGTGGATGAAGCCAATTATTGAAACCCACGGCATGGTGCCAATGAATCGTCTGACCGATGATCCGCGCTGGCTACCGGCGATGAGCGAA
SspI (2928)

438▶ rGlyLeuTyrValValAspGluAlaAsnI leGluThrHisGlyMetValProMetAsnArgLeuThrAspAspProArgTrpLeuProAlaMetSerGlu
3000 CGCGTAACGCGAATGGTGCAGCGCGATCGTAATCACCCGAGTGTGATCATCTGGTCGCTGGGAATGAATCAGGCCACGGCGTAATCACGACGCGCTGT
BsaBI (3024)

472▶ ArgValThrArgMetValGlnArgAspArgAsnHisProSerValI leI leTrpSerLeuGlyAsnGluSerGlyHisGlyAlaAsnHisAspAlaLeuT
3100 ATCGCTGGATCAATCTGTCGATCCTTCCCGCCGGTGCAGTATGAAGCGGCGGAGCCGACACCACGGCCACCGATATTATTTGCCGATGTACGCCGG
BssHII (3196)

505▶ yrArgTrpI leLysSerValAspProSerArgProValGlnTyrGluGlyGlyGlyAlaAspThrThrAlaThrAspI leI leCysProMetTyrAlaAr
3200 CGTGGATGAAGACCAGCCCTTCCCGGCTGTGCCGAAATGGTCCATCAAAAAATGGCTTTCGTACCTGGAGAGACGCCCGCTGATCCTTTGCCAATAC

538▶ gValAspGluAspGlnProPheProAlaValProLysTrpSerI leLysLysTrpLeuSerLeuProGlyGluThrArgProLeuI leLeuCysGluTyr
3300 GCCCACGCGATGGGTAACAGTCTTGGCGGTTTCGCTAAATACTGGCAGGCGTTCGTAGTATCCCGTTTACAGGGCGGCTTCGTCTGGGACTGGGTGG

572▶ AlaHisAlaMetGlyAsnSerLeuGlyGlyPheAlaLysTyrTrpGlnAlaPheArgGlnTyrProArgLeuGlnGlyGlyPheValTrpAspTrpValA
3400 ATCAGTCGCTGATTAATATGATGAAAACGGCAACCCGTGGTCGGCTTACGGCGGTGATTTTGGCGATACGCCGAACGATCGCCAGTTCTGTATGAACGG

605▶ spGlnSerLeuI leLysTyrAspGluAsnGlyAsnProTrpSerAlaTyrGlyGlyAspPheGlyAspThrProAsnAspArgGlnPheCysMetAsnGl
3500 TCTGGTCTTTGCCGACCGCACGCCGATCCAGCGCTGACGGAAGCAAAACACCAGCAGCAGTTTTTCCAGTTCCGTTTATCCGGGCAAACCATCGAAGTG
Eco47III (3533)

638▶ yLeuValPheAlaAspArgThrProHisProAlaLeuThrGluAlaLysHisGlnGlnGlnPhePheGlnPheArgLeuSerGlyGlnThrI leGluVal
3600 ACCAGCGAATACCTGTTCCGTCATAGCGATAACGAGCTCCTGCACTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCCTCTGGATG
SacI (3638)

672▶ ThrSerGluTyrLeuPheArgHisSerAspAsnGluLeuLeuHisTrpMetValAlaLeuAspGlyLysProLeuAlaSerGlyGluValProLeuAspV
3700 TCGCTCCACAAGGTAAACAGTTGATTGAACTGCTGAACTACCGCAGCCGGAGAGCCGGGCAACTCTGGCTCACAGTACGCGTAGTGCAACCGAACCGC

705▶ alAlaProGlnGlyLysGlnLeuI leGluLeuProGluLeuProGlnProGluSerAlaGlyGlnLeuTrpLeuThrValArgValValGlnProAsnAl
3800 GACCGCATGGTCAGAAGCCGGGCACATCAGCGCTGGCAGCAGTGGCGTCTGGCGGAAAACCTCAGTGTGACGCTCCCGCCGCTCCACGCGCATCCCG

738▶ aThrAlaTrpSerGluAlaGlyHisI leSerAlaTrpGlnGlnTrpArgLeuAlaGluAsnLeuSerValThrLeuProAlaAlaSerHisAlaI lePro
3900 CATCTGACCACCAGCGAATGGATTTTGCATCGAGCTGGTAATAAGCGTTGGCAATTTAACGCCAGTCAGGCTTTTTCACAGATGTGGATTGGCG

772▶ HisLeuThrThrSerGluMetAspPheCysI leGluLeuGlyAsnLysArgTrpGlnPheAsnArgGlnSerGlyPheLeuSerGlnMetTrpI leGlyA
4000 ATAAAAACAACCTGCTGACGCCGCTGCGCATGATTCACCCGTGCACCGCTGGATAACGACATTGGCGTAAGTGAAGCGACCCGATTGACCTAACGC

805▶ spLysLysGlnLeuLeuThrProLeuArgAspGlnPheThrArgAlaProLeuAspAsnAspI leGlyValSerGluAlaThrArgI leAspProAsnAl
4100 CTGGGTGAAACGCTGGAAGCGCGGGCCATTACCAGCCGAAGCAGCGTTGTTGCAGTGCACGGCAGATACACTTGTGATGCGGTGCTGATTACGACC

838▶ aTrpValGluArgTrpLysAlaAlaGlyHisTyrGlnAlaGluAlaAlaLeuLeuGlnCysThrAlaAspThrLeuAlaAspAlaValLeuI leThrThr
4200 GCTCACGCGTGGCAGCATCAGGGGAAAACCTTATTTATCAGCCGAAAACCTACCGGATTGATGGTAGTGGTCAAATGGCGATTACCGTTGATGTTGAAG

872▶ AlaHisAlaTrpGlnHisGlnGlyLysThrLeuPheI leSerArgLysThrTyrArgI leAspGlySerGlyGlnMetAlal leThrValAspValGluV
4300 TGGCGAGCGATACCCGATCCGGCGCGGATTGGCTGAACTGCCAGCTGGCGCAGGTAGCAGAGCGGGTAAACTGGCTCGGATTAGGGCCGCAAGAAAA

905▶ alAlaSerAspThrProHisProAlaArgI leGlyLeuAsnCysGlnLeuAlaGlnValAlaGluArgValAsnTrpLeuGlyLeuGlyProGlnGluAs
4400 CTATCCCGACCGCCTTACTGCCGCTGTTTTGACCGCTGGGATCTGCCATTGTCAGACATGTATACCCGCTACGCTTCCCGAGCGAAAACGGTCTGCGC
BsiWI (4468)
Bst1107I (4460)

938▶ nTyrProAspArgLeuThrAlaAlaCysPheAspArgTrpAspLeuProLeuSerAspMetTyrThrProTyrValPheProSerGluAsnGlyLeuArg
4500 TGGGGACGCGCAATGAATTATGGCCACACCAGTGGCGCGGCGACTTCCAGTTCAACATCAGCCGCTACAGTCAACAGCAACTGATGGAACACGCGC

972▶ CysGlyThrArgGluLeuAsnTyrGlyProHisGlnTrpArgGlyAspPheGlnPheAsnI leSerArgTyrSerGlnGlnGlnLeuMetGluThrSerH
4600 ATCGCCATCTGCTGCACGCGGAAGAAGGCACATGGCTGAATATCGACGGTTTCCATATGGGGATTGGTGGCGAGACTCTGGAGCCCGTCAGTATCGGC
NdeI (4655)

1005▶ isArgHisLeuLeuHisAlaGluGluGlyThrTrpLeuAsnI leAspGlyPheHisMetGlyI leGlyGlyAspAspSerTrpSerProSerValSerAl

NheI (4777)
EcoRI (4771)

4700 GGAATTACAGCTGAGCGCCGGTCGCTACCATTACCAGTTGGTCTGGTGTCAAAAATAATAATCTAGTCGAGAATTCGCTAGCTCGACATGATAAGATACA

1038▶ aGluLeuGlnLeuSerAlaGlyArgTyrHisTyrGlnLeuValTrpCysGlnLys•••

4800 TTGATGAGTTTGACAAACCACTAGAAATGCAAGTGAATAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTGAAATTTGTGATGCT

MfeI (4951)

4900 ATTGCTTTATTTGTAACCATTATAAGCTGCAATAAACAAGTTAACAACAACAATTGCATTCATTTTATGTTTCAGGTTACAGGGGAGGTGTGGGAGGTTT

SwaI (5042)

5000 TTTAAAGCAAGTAAACCTCTACAAATGTGGTAGATCCATTTAAATGTTAATTAAGTACCATGACCAAAATCCCTTAACGTGAGTTTTCGTCCACTGA

5100 CCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTCTGCGGTAATCTGCTGCTTGCAAACAAAAAACCCCGCTACCAGCGG

5200 TGGTTTTGTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGTAACTGGCTTCAGCAGAGCGCAGATACCAATACTGTTCTTCTAGTGTAGCCGTA

5300 GTTAGGCCACCACCTTCAAGAACTCTGTAGCACCGCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTGTCTT

5400 ACCGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTGCGGCTGAACGGGGGTTCTGTCACACAGCCAGCTTGAGCGAACGACCTACA

5500 CCGAACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTCCCGAAGGGAGAAAGCGGACAGGTATCCGGTAAGCGGCAGGGTCCGGAACAGG

5600 AGAGCGCACGAGGGAGCTTCCAGGGGAAACGCCTGGTATCTTTATAGTCTGTGCGGTTTTGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCG

5700 TCAGGGGGCGGAGCCTATGAAAAACGCCAGCAACGCGCCTTTTTACGGTTCCTGGCCTTTTGTGCTCATGTTCTTAATTAATTTT

AseI (5818)

SfiI (5869) MscI (5880)

5800 TCAAAAGTAGTTGACAATTAATCATCGGCATAGTATATCGGCATAGTATAATACGACTCACTATAGGAGGGCCATCATGGCCAAGTTGACCAGTGCTGTC

5900 CCAGTGCTCACAGCCAGGGATGTGGCTGGAGCTGTTGAGTCTGGACTGACAGGTTGGGTTCTCCAGAGATTTTGTGGAGGATGACTTTCAGGTGTGG

6000 TCAGAGATGATGTCACCTGTTTCATCTCAGCAGTCCAGGACCAGGTGGTGCCTGACAACACCCTGGCTTGGGTGTGGGTGAGAGGACTGGATGAGCTGTA

6100 TGCTGAGTGGAGTGAGGTGGTCTCCACCAACTTCAGGGATGCCAGTGGCCCTGCCATGACAGAGATTGGAGAGCAGCCCTGGGGGAGAGATTTGCCCTG

SfiI (6278)

EcoO109I (6278)

6200 AGAGACCCAGCAGGCAACTGTGTGCACTTTGTGGCAGAGGAGCAGGACTGAGGATAAGAATTGAGTTTCAGAAAAGGGGCGCTGAGTGGCCCTTTTTTC

109▶ ArgAspProAlaGlyAsnCysValHisPheValAlaGluGluGlnAsp•••

6300 AACTTAATTAA