



Bsp120I (7)  
PstI (6)  
SdaI (6) SpeI (13) SandI (40)

1 CCTGCAGGGCCCACTAGTTACCGACCACCCGCAAACAGCAGGGTCCCTGGGCTTCCCAAGCCGCGCACCTCTCCGCCCGCCCTGCGCCCTCTTCTCT

SacII (195)  
EagI (189)

101 CCGGTCTGCCCTCTCCCCACCCCGCCTTCTCCCTCCCCGCCAGCGGCATGCGCCGCGCTCGGAGCGTGTTCCTATAAAAGTCCGCCCGGCCA

NeoI (296)  
BstEII (291)

201 GAAACTTCAGTTTGTGGCTGCGGCAGCAGGTAGCAAAGTGACGCCGAGGGCCTGAGTGCTCCAGTAGCCACCGCATCTGGAGAACCAGCGGTTACCATG

Met  
Bsu36I (395)  
Acc65I (390)

301 GGGGTTCTCATCATCATCATCATCATGGTATGGCTAGCATGACTGGTGACAGCAAATGGGTCGGGATCTGTACGACGATGACGATAAGGTACCTAAGG  
2> Gl yGl ySer Hi sHi sHi sHi sHi sHi sGl yMetAl aSer Met Thr Gl yGl yGl nGl nMet Gl yArg AspLeu Tyr Asp Asp Asp Asp Lys Val P roLys A  
401 ATCAGCTTGGAGTTGATCCCGTCTTTTACAACGTCGTGACTGGGAAAACCTGGCGTTACCAACTTAATCGCCTTGACGACATCCCCCTTCCGCCAG  
35> spGl nLeuGl yVal Asp P roVal Val LeuGl nArg Arg Asp T rpGl uAsn P roGl yVal Thr Gl nLeuAsn ArgLeuAl aAl aHi s P roP roPheAl aSe  
501 CTGGCGTAATAGCGAAGAGGCCCGACCGATCGCCCTTCCCAACAGTTGGCGAGCCTGAATGGCGAATGGCGCTTTCCTGGTTCCGGCACCAGAAGCG  
68> r T rpArg Asn Ser Gl uGl uAl aArg Thr Asp Arg P roSer Gl nGl nLeuArg Ser LeuAsn Gl yGl uT rpArg PheAl aT rpPheP roAl aP roGl uAl a  
Bsu36I (632)

601 GTGCCGAAAGCTGGCTGGAGTGCATCTTCTGAGGCCGATACTGTCGTCTGCCCTCAAACCTGGCAGATGCACGGTTACGATGCGCCATCTACACCA  
102> Val P roGl uSer T rpLeuGl uCys AspLeu P roGl uAl aAsp Thr Val Val Val P roSer Asn T rpGl nMet Hi sGl yTyr AspAl aP roI l eTyr Thr A  
701 ACGTAACCTATCCATTACGGTCAATCCGCGTTTGTCCACGAGAATCCGACGGGTTGTTACTCGCTCACATTTAATGTTGATGAAAGCTGCTACA  
135> snVal Thr Tyr P roI l eThr Val Asn P roP roPheVal P roThr Gl uAsn P roThr Gl yCys Tyr Ser LeuThr PheAsnVal AspGl uSer T rpLeuGl  
801 GGAAGCCAGACGCGAATTATTTTGTATGGCGTAACTCGGCGTTTCATCTGTGGTGCACGGGCGCTGGGTCGGTTACGGCCAGGACAGTCTGTTGCCG  
168> nGl uGl yGl nThr Arg I l eI l ePhe AspGl yVal Asn Ser Al aPheHi sLeuT rpCys AsnGl yArg T rpVal Gl yTyr Gl yGl nAsp Ser ArgLeuP ro  
901 TCTGAATTTGACCTGAGCGCATTTTACGCGCCGAGAAAACCGCCTCGCGGTGATGGTGTCTGCTGGAGTGCAGGCGATTTATCTGGAAGATCAGGATA  
202> Ser Gl uPheAspLeuSer Al aPheLeuArgAl aGl yGl uAsnArgLeuAl aVal MetVal l euArg T rpSer AspGl ySer TyrLeuGl uAspGl nAspM  
AatII (1031)

1001 TGTGGCGGATGAGCGGCATTTTCCGTGACGTCTCGTTGCTGCATAAACCGACTACACAATCAGCGATTTCCATGTTGCCACTCGCTTAAATGATGATTT  
235> et T rpArg Met Ser Gl yI l ePhe Arg Asp Val Ser LeuLeuHi sLys P roThr Thr Gl nI l eSer AspPheHi sValAl aThr ArgPheAsnAspAspPh  
1101 CAGCCGCGCTGACTGGAGGCTGAAGTTCAGATGTGCGGCGAGTTGCGTGACTACCTACGGGTAACAGTTTCTTTATGGCAGGTTGAAACGACGAGTCCGC  
268> eSer ArgAl aVal LeuGl uAl aGl uVal Gl nMet CysGl yGl uLeuArg Asp TyrLeuArgVal Thr Val Ser LeuT rpGl nGl yGl uThr Gl nValAl a

ClaI (1232)

1201 AGCGGCACCGCCTTTCCGGCGTGAAATTATCGATGAGCGTGGTGGTTATGCCGATCGCGTCACTACGTCTGAACGTCGAAAACCCGAAACTGTGGA  
302> Ser Gl yThrAl aP roPheGl yGl yGl uI l eI l eAspGl uArgGl yCyl yTyrAl aAspArgVal Thr LeuArgLeuAsnVal Gl uAsn P roLysLeuT rpS  
1301 GCGCGAAATCCCGAATCTCTACGTGCGGTGGTTGAACGTGCACACCGCCGACGCTGATTGAAGCAGAAAGCTCGATGTCGGTTCCGCGAGGT  
335> erAl aGl uI l eP roAsnLeuTyrArgAl aVal Val Gl uLeuHi sThr Al aAspGl yThr LeuI l eGl uAl aGl uAl aCys AspVal Gl yPheArgGl uVa  
1401 GCGGATTGAAATGGTCTGCTGCTGCTGAACGGCAAGCGTGGTGTATCGAGGCGTTAACCGTCAAGGATCATCTCTGCATGGTCAGGTCATGGAT  
368> l ArgI l eGl uAsnGl yLeuLeuLeuLeuAsnGl yLys P roLeuLeuI l eArgGl yVal AsnArgHi sGl uHi sHi sP roLeuHi sGl yGl nVal MetAsp  
EcoRV (1521) DraIII (1598)

1501 GAGCAGACGATGGTGCAGGATATCTGCTGATGAAGCAGAACAACCTTTAACGCGGTGCGCTGTTGCGATTATCCGAACCATCCGCTGTGGTACACGCTGT  
402> Gl uGl nThr MetVal Gl nAspI l eLeuLeuMetLysGl nAsnAsnPheAsnAl aVal A rgCys Ser Hi sTyr P roAsnHi sP roLeuT rpTyrThr LeuC  
SspI (1638)

1601 GCGACCGCTACGGCTGTATGTGGTGGATGAAGCCAATATTGAAACCCACGGCATGGTGCCAATGAATCGTCTGACCGATGATCCGCGCTGGCTACCGGC  
435> ysAspArgTyrGl yLeuTyrVal Val AspGl uAl aAsnI l eGl uThr Hi sGl yMetVal l eP roMetAsnArgLeuThrAspAspP roArgT rpLeuP roAl  
BsaBI (1734)

1701 GATGAGCGAACCGGTAACCGAATGGTGCAGCGCATCGTAATCACCCGAGTGTGATCATCTGGTCTGCTGGGGAATGAATCAGGCCACGGCGCTAATCAC  
468> aMetSer Gl uArgVal Thr ArgMetVal Gl nArgAspArgAsnHi sP roSer Val I l eI l eT rpSer LeuGl yAsnGl uSer Gl yHi sGl yAl aAsnHi s  
1801 GACGCGCTGTATCGCTGGATCAAATCTGTGCATCTTCCCGCCGGTGAGTATGAAGCGGCGGAGCCGACACCAGGCCACCGATATTATTTGCCCGA  
502> AspAl aLeuTyrArgT rpI l eLysTyrVal AspP roSer ArgP roVal Gl nTyrGl uGl yGl yGl yAl aAspThr ThrAl aThrAspI l eI l eCysP roM  
BssHIII (1906) BbsI (1925)

1901 TGTACGCGCGCTGGATGAAGACCAGCCCTTCCCGGCTGTGCCGAAATGGTCCATCAAAAAATGGCTTTCGCTACCTGGAGAGACGCGCCCGCTGATCCT  
535> etTyrAl aArgVal AspGl uAspGl nP roPheP roAl aVal P roLysT rpSer I l eLysLysT rpLeuSer LeuP roGl yGl uThr ArgP roLeuI l eLe  
2001 TTGCGAATACGCCACGGATGGTAACAGTCTTGGCGGTTTCGCTAAATACTGGCAGGCGTTTCGTCAGTATCCCGTTTACAGGGCGGCTTCGCTGG  
568> uCysGl uTyrAl aHi sAl aMetGl yAsnSer LeuGl yGl yPheAl aLysTyrT rpGl nAl aPheArgGl nTyrP roArgLeuGl nGl yGl yPheVal T rp  
2101 GACTGGGTGGATCAGTCTGATTAATATGATGAAAACCGCAACCCGTGGTGGCTTACGGCGGTGATTTTGGCGATACGCCGAACGATCGCCAGTTCT  
602> AspT rpVal AspGl nSer LeuI l eLysTyrAspGl uAsnGl yAsn P roT rpSerAl aTyrGl yGl yAspPheGl yAspThr P roAsnAspArgGl nPheC  
Eco47III (2243)

2201 GTATGAACGGTCTGGTCTTTGCCGACCGCAGCCGCATCCAGCGTACGAGCAAGCAAAACACCAGCAGCAGTTTTTCCAGTTCGGTTTATCCGGGCAAC  
635> ysMetAsnGl yLeuVal PheAl aAspArgThr P roHi sP roAl aLeuThr Gl uAl aLysHi sGl nGl nGl nPhePheGl nPheArgLeuSer Gl yGl nTh  
SacI (2348)

2301 CATCGAAGTGACCAGCAATACCTGTTCCGTCATAGCGATAACGAGCTCCTGCACTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTG  
668> r I l eGl uVal Thr Ser Gl uTyrLeuPheArgHi sTyrAspAsnGl uLeuHi sT rpMetVal Al aLeuAspGl yLysP roLeuAl aSer Gl yGl uVal I  
2401 CCTCTGGATGCTGCCACAAGGTAACACAGTTGATTTGAACCTGCCTGAACCTACCGCAGCCGAGAGCGCCGGCAACTCTGGTCAAGTACCGCTAGTGC  
702> P roLeuAspValAl aP roGl nGl yLysGl nLeuI l eGl uLeuP roGl uLeuP roGl nP roGl uSerAl aGl yGl nLeuT rpLeuThr Val A rgVal Val G  
2501 AACCGAACCGACCGCATGGTCAAGCCGGGCACATCAGCGCTGGCAGCAGTGGCGTCTGGCGAAAACCTCAGTGTGACGCTCCCGCCGCGTCCCA  
735> l nP roAsnAl aThrAl aT rpSer Gl uAl aGl yHi sI l eSer Al aT rpGl nGl nT rpArgLeuAl aGl uAsnLeuSer Val Thr LeuP roAl aAl aSer Hi  
2601 CGCCATCCCGCATCTGACCACAGCGAAATGGATTTTTCAGTGCAGCTGGGTAATAAGCGTTGGCAATTAACCGCCAGTCAAGGCTTTCTTTACAGATG  
768> sAl aI l eP roHi sLeuThr Thr Ser Gl uMetAspPheCysI l eGl uLeuGl yAsnLysArgT rpGl nGl uLeuAsnArgGl nSer Gl yPheAsnGl nMet  
2701 TGGATTGGCGATAAAAAACAACCTGCTGACCGCTGCGCGATCAGTTACCCGCTGCACCGCTGGATAACGACATTGGCGTAAGTGAAGCGACCCGATTC  
802> T rpI l eGl uAspLvsLvsGl nLeuLeuThr P roLeuArdAspGl nPheThr A rdAl aP roLeuAspAsnAspI l eGl uVal Ser Gl uAl aThr A rdI l eA

2801 ACCCTAACGCCTGGGTCGAACGCTGGAAGGCGGGCCATTACCAGGCCGAAGCAGCGTTGTTGCAGTGCACGGCAGATACACTTGCTGATCGGGTCT  
835▶ spP roAsnAl aTrpVal Gl uArgTrpLysAl aAl aGl yHi sTyrGl nAl aGl uAl aAl aLeuLeuGl nCysThrAl aAspThrLeuAl aAspAl aVal Le  
2901 GATTACGACCGCTCACGGTGGCAGCATCAGGGGAAAACCTTATTATCAGCCGAAAACCTACCGATTGATGGTAGTGGTCAAATGGCGATTACCGTT  
868▶ ul l eThr Thr Al aHi sAl aTrpGl nHi sGl nGl yLysThrLeuPhe l l eSer ArgLysThr TyrArg l l eAspGl ySer Gl yGl nMetAl a l l eThr Val  
3001 GATGTTGAAGTGGCGAGCGATACACCGCATCCGGCGGGATTGGCTGAACTGCCAGCTGGCGCAGGTAGCAGAGCGGGTAAACTGGCTCGGATTAGGGC  
902▶ AspVal Gl uValAl aSerAspThr ProHi sProAl aArg l l eGl yLeuAsnCysGl nLeuAl aGl nValAl aGl uArgValAl aSerTrpLeuGl yLeuGl yP  
BbsI (3177)  
Bst1107I (3170)  
BspLU11I (3167) BsiWI (3178)  
3101 CGCAAGAAAACCTATCCCGACCGCTTACTGCCGCTGTTTTGACCGCTGGGATCTGCCATTGTTCAGACATGTATACCCCGTACGCTCTCCCGAGCGAAAA  
935▶ r oGl nGl uAsnTyrP roAspArgLeuThrAl aAl aCysPheAspArgTrpAspLeuP roLeuSerAspMetTyrThr P roTyrVal l PheP roSer Gl uAs  
3201 CGGTCTGCGCTGCGGGACGCGCAATTGAATTATGGCCACACCAGTGGCGGGCGACTTCCAGTTCAACATCAGCCGCTACAGTCAACAGCAACTGATG  
968▶ nGl yLeuArgCysGl yThrArgGl uLeuAsnTyrGl yProHi sGl nTrpArgGl yAspPheGl nPheAsn l l eSer ArgTyrSer Gl nGl nGl nLeuMet  
NdeI (3365)  
3301 GAAACCAGCCATCGCCATCTGCTGCACGCGGAAGAAGGCACATGGCTGAATATCGACGGTTTCCATATGGGGATTGGTGGCGCAGCTCTGGAGCCCGT  
1002▶ Gl uThr Ser Hi sArgHi sLeuLeuHi sAl aGl uGl uGl yThr TrpLeuAsn l l eAspGl yPheHi sMetGl y l l eGl yGl yAspAspSer TrpSer P roS  
NheI (3487)  
EcoRI (3481)  
3401 CAGTATCGCGGAATTACAGCTGAGCGCCGGTCTACATTACCAGTTGGTCTGGTGTCAAAAATAATAATCTAGTCGAGAATTCGCTAGCTCGACATG  
1035▶ er Val SerAl aGl uLeuGl nLeuSerAl aGl yArgTyrHi sTyrGl nLeuVal l TrpCysGl nLys ●●●  
3501 ATAAGATACATTGATGAGTTTGGACAAACCACAACCTAGAATGCAGTGAATAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTGAAAT

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3601 TTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAAACAAGTTAACAACAACAATTGCATTTCATTTTATGTTTCAGGTTTCAGGGGAGGTG

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DraI (3710) DraI (3749) SwaI (3752)  
3701 TGGGAGGTTTTTTAAAGCAAGTAAACCTCTACAAATGTGGTAGATCCATTTAAATGTTAATTAAGTACCATGACCAAAATCCCTTAACGTGAGTTTTTC  
3801 GTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAACCCG  
3901 CTACCAGCGGTGTTTTGTTTCCCGATCAAGAGCTACCAACTCTTTTTCCGAAGTAACTGGCTTCAGCAGAGCGCAGATACCAATACTGTTCTTCTAG  
4001 TGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCCTACATACCTCGCTCTGTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAA  
4101 GTCGTGCTTACCAGGTTGGACTCAAGACGATAGTTACCAGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGTTCTGTGCACACAGCCAGCTTGAGCGGA  
4201 ACGACCTACACCGAACTGAGATACTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGG  
4301 TCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGAAACGCCTGGTATCTTTATAGTCTGTGCGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTT  
BspLU11I (4490)  
4401 GTGATGCTCGTCAGGGGGCGGAGCCTATGAAAAACGCCAGCAACCGCGCCTTTTTACGGTTCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTA

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AseI (4528) SfiI (4579) MscI (4590)  
4501 ATTAATTTTTCAAAAGTAGTTGACAATTAATCATCGGCATAGTATATCGGCATAGTATAATACGACTCACTATAGGAGGGCCATCATGGCCAAGTTGAC  
1▶ MetAl aLysLeuTh  
4601 CAGTGTGCTCCAGTGTCTCACAGCCAGGGATGTGGCTGGAGCTGTTGAGTTCTGGACTGACAGGTTGGGGTTCTCCAGAGATTTGTGGAGGATGACTTT  
5▶ r SerAl aVal l ProVal l LeuThrAl aArgAspValAl aGl yAl aVal Gl uPheTrpThrAspArgLeuGl yPheSer ArgAspPheVal Gl uAspAspPhe  
4701 GCAGGTGTGGTCAGAGATGATGTCAACCCTGTTTCATCTCAGCAGTCCAGGACCCAGGTTGGTGCCTGACAACACCCTGGCTTGGGTGGGTGAGAGGACTGG  
39▶ Al aGl yVal l Val l ArgAspAspVal l ThrLeuPhe l l eSerAl aVal Gl nAspGl nVal l Val l ProAspAsnThrLeuAl aTrpVal l TrpVal l ArgGl yLeuA  
4801 ATGAGCTGTATGCTGAGTGGAGTGGTGTCTCCACCAACTTCAGGGATGCCAGTGGCCTGCCATGACAGAGATTGGAGAGCAGCCCTGGGGGAGAGA  
72▶ spGl uLeuTyrAl aGl uTrpSer Gl uVal l Val Ser ThrAsnPheArgAspAl aSer Gl yProAl aMetThr Gl u l l eGl yGl uGl nProTrpGl yArgGl  
DraIII (4940) SfiI (4988)  
4901 GTTTCCTGAGAGACCCAGCAGGCAACTGTGTGCACCTTTGTGGCAGAGGAGCAGGACTGAGGATAAGAATTGAGTTTCAAAAAGGGGCGCTGAGTGGC  
105▶ uPheAl aLeuArgAspP roAl aGl yAsnCysVal l Hi sPheValAl aGl uGl uGl nAsp ●●●  
5001 CCCTTTTTCAACTAATTAA

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