



150

PstI (6)
SdaI (6)
1 CCTGCAGGACCTTGCTTCTAGCTGGCCCTTCTCTCTCTATAAATACCAGCTCTGGTATTTGCGCTTGGCAGCTGTTGCTG CTAGGGAGACGGCTG

NsiI (112)
101 GCTTGACATGCATCTCTGACAAAAACAAACCCGTGGTGTGAGTGGGTGTGGGCGGTGTGAGTAGGGGATGAATCAGAGAGGGGGCAGGGAGACAGG
201 GCGCAGGAGTCAAGCAAAGGCGATGCGGGGGTGGACTACACGCAGTTGAAACAGTCGTAGAAGATTCTGAAACTATCTTGCTGGCTATAAACTTG

NsiI (376)
301 AGGGAAGCAGAAGGCCAACATTCCTCCCAAGGAAACTGAGGCTCAGAGTTAAAAACCCAGGTATCAGTGATATGCATGTGCCCGGCCAGGGTCACTCTC

Acc65I (410)
AgeI (407)
401 TGACTAACCGGTACCTACCTACAGGCCTACCTAGAGACTCTTTTGAAGGATGGTAGAGACCTGTCCGGGCTTTGCCACAGCTGTTGAAACCTCAGC
501 ATTTTCTAGGCAACTTGTCGAATAAAACACTTCGGGGTCTTCTTGTTTCATTCCAATAACCTAAAACCTCTCTCGGAGAAAATAGGGGGCTCAAC

EagI (665)
NaeI (665)
601 AAACGAAATTCTCTAGCCGCTTTCCCAAGGATAAGGCAGGCATCCAATGAAAAAAGGGGCGCGGGGGTCTCTGTCAAGCTCCTTGCCTGTGA
701 AACCCAGCAGGCTGCTGTCTTCTGTCTTGGGGTGTCCAGGGGCGCAGGCCTTTCGGGGGAGCTGGCTCCCGCCCTCGCTGTGGCCG

PstI (831)
BamHI (822) **KasI (846)**
801 CCTTTTCTGGCAGGACAGAGGGATCTGCAGCTGTCCAGGGAGGGGCGCCGGGGGTGATGTCAAGAGGGCTACAAATAGTCAGACAGCTAAGGGGCT

NaeI (930) **NcoI (990)**
901 CCGTCACCCATCTTACATCCACTCCAGCCGGTCCCGCCGCTGCCTCTGTGCGTCCGCCAGCCAGCCTCGTCCACGCCACCATGGGGGGT
MetGI yGI y

NheI (1028) **Bsu36I (1089)**
1001 TCTCATCATCATCATCATCATGGTATGGCTAGCATGACTGGTGGACAGCAAATGGTTCGGATCTGTACGACGATGACGATAAGGTACCTAAGGATCAGC
4 Ser Hi sHi sHi sHi sHi sHi sGI yMe tAl aSer Me tThr GI yGI yGI nGI nMe tGI yAr gAspLeuTyrAspAspAspAspLysVal P roLysAspGI nL
1101 TTGGAGTTGATCCCGTCTTTTACAACGCTCGTACTGGGAAAAACCTGGCGTTACCCAATTAATCGCCTTGACAGACATCCCCCTTTCGCCAGCTGGCG
37 euGI yVal AspP roVal Val LeuGI nArgArgAspTrpGI uAsnP roGI yVal Thr GI nLeuAsnArgLeuAl aAl aHi sP roP roPheAl aSer TrpAr
1201 TAATAGCGAAGAGGCCCGCACCATCGCCCTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGCTTTGCCTGGTTCCGGCACCAGAAGCGGTGCCG
70 gAsnSer GI uGI uAl aArgThrAspArgP roSer GI nGI nLeuArgSer LeuAsnGI yGI uTrpArgPheAl aTrpPheP roAl aP roGI uAl aVal P ro

FspI (1244)
Bsu36I (1326)
1301 GAAAGCTGGTGGAGTGCATCTTCTGAGGCCGATATGTCGTCTGCCCTCAAACCTGGCAGATGCACGGTTACGATGCGCCATCTACACCAACGTAA
104 GI uSer TrpLeuGI uCysAspLeuP roGI uAl aAspThr Val Val Val P roSerAsnTrpGI nMe tHi sGI yTyrAspAl aP roI l eTyrThrAsnVal T
1401 CCTATCCCATTACGGTCAATCCGCCGTTTGTCCACGGAGAATCCGACGGGTGTACTCGTCACATTTAATGTTGATGAAAGCTGGCTACAGGAAG
137 hr TyrP roI l eThr ValAsnP roP roPheVal P roThr GI uAsnP roThr GI yCysTyrSer LeuThr PheAsnVal AspGI uSer TrpLeuGI nGI uGI
1501 CCAGACGCGAATTTTTGATGGCGTTAACTCGGCGTTTCATCTGTGGTGAACGGGCGCTGGGTACGGCCAGGACAGTCGTTTCCGCTGTAA
170 yGI nThr ArgI l eI l ePheAspGI yVal AsnSer Al aPheHi sLeuTrpCysAsnGI yArgTrpVal GI yTyrGI yGI nAspSer ArgLeuP roSer GI u
1601 TTTGACCTGAGCGCATTTTACGCGCCGGAGAAAACCGCTCGCGGTGATGGTGTGCGTTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGC
204 PheAspLeuSer Al aPheLeuArgAl aGI yGI uAsnArgLeuAl aVal MetVal LeuArgTrpSerAspGI ySer TyrLeuGI uAspGI nAspMe tTrpA

AatII (1725)
1701 GGATGAGCGCATTTTCCGTGACGTCTCGTTGCTGCATAAACCGACTACACAATCAGCGATTTCCATGTTGCCACTCGCTTTAATGATGATTTACGCCG
237 r gMe tSer GI yI l ePheArgAspVal Ser LeuLeuHi sLysP roThr Thr GI nI l eSerAspPheHi sValAl aThr ArgPheAsnAspAspPheSer Ar
1801 CGCTGACTGGAGGCTGAAGTTCAGATGTGCGGCGAGTTGCGTGACTACTACGGTAACAGTTTCTTTATGGCAGGGTGAACAGCAGGTCGCCAGCGGC
270 gAl aVal LeuGI uAl aGI uVal GI nMe tCysGI yGI uLeuArgAspTyrLeuArgVal Thr Val Ser LeuTrpGI nGI yGI uThr GI nValAl aSer GI y

ClaI (1926)
1901 ACCGCGCTTTCCGCGGTGAAATATTCGATGAGCGTGGTGGTTATGCCGATCGCGTCACACTACGCTGTAACGTGAAAACCCGAAACTGTGGAGCGCCG
304 Thr Al aP roPheGI yGI yGI uI l eI l eAspGI uArgGI yGI yTyrAl aAspArgVal Thr LeuArgLeuAsnVal GI uAsnP roLysLeuTrpSer Al aG
2001 AAATCCGAATCTCTATCGTGGGTGGTTGAATGCACACCCGCGACGGCAGCTGATTGAAGCAGAAGCCTGCGATGTCGGTTCCGCGAGGTGGGAT
337 I uI l eP roAsnLeuTyrArgAl aVal Val GI uLeuHi sThr Al aAspGI yThr LeuI l eGI uAl aGI uAl aCysAspVal GI yPheArgGI uVal ArgI l
2101 TGAAAATGGTCTGCTGCTGCTGAACGGCAAGCCGTTGCTGATTCGAGGCGTTAACCGTCACGAGCATCTCTGCTGATGGTCAAGTCAATGATGAGCAG
370 eGI uAsnGI yLeuLeuLeuLeuAsnGI yLysP roLeuLeuI l eArgGI yVal AsnArgHi sGI uHi sHi sP roLeuHi sGI yGI nVal MetAspGI uGI n

EcoRV (2215) **DraIII (2292)**
2201 ACGATGGTGCAGGATATCTGCTGATGAAGCAGAACAACCTTAAACGCCGTGCGCTGTTGCATTATCCGAACCATCCGCTGTGGTACACGCTGTGCGACC
404 Thr Me tVal GI nAspI l eLeuLeuMe tLysGI nAsnAsnPheAsnAl aVal Ar gCysSer Hi sTyrP roAsnHi sP roLeuTrpTyrThr LeuCysAspA

SspI (2332)
2301 GCTACGGCCTGTATGTGGTGGATGAAGCCAATATTGAAACCCACGGCATGGTGCCTGAATCGTCTGACCGATGATCCGCGTGGCTACCGCGATGAG
437 r gTyrGI yLeuTyrVal Val AspGI uAl aAsnI l eGI uThr Hi sGI yMe tVal P roMe tAsnArgLeuThrAspAspP roArgTrpLeuP roAl aMe tSe

BsaBI (2428)
2401 CGAACCGTAACGCGAATGGTGCAGCGCATCGTAATCACCCGAGTGTGATCATCTGGTCTGGGGAATGAATCAGGCCACGGCGCTAATCACGACGCG
470 r GI uArgVal Thr ArgMe tVal GI nArgAspArgAsnHi sP roSer Val I l eI l eTrpSer LeuGI yAsnGI uSer GI yHi sGI yAl aAsnHi sAspAl a

BssHIII
2501 CTGTATCGCTGGATCAAATCTGTCGATCCTTCCGCCCCGTGCGATGAAGGCGGGAGCCGACACCAGGCCACCGATATTTATTTGCCGATGTACG
504 LeuTyrArgTrpI l eLysSer Val AspP roSerArgP roVal GI nTyrGI uGI yGI yGI yAl aAspThr Thr Al aThrAspI l eI l eCysP roMe tTyrA
2601 CGCGCGTGGATGAAGACCAGCCCTTCCCGCTGTGCCGAATGGTCCATCAAAAATGGCTTTCGCTACCTGGAGAGACGCGCCCGCTGATCCTTTGCGA
537 I aArgVal AspGI uAspGI nP roPheP roAl aVal P roLysTrpSer I l eLysLysTrpLeuSer LeuP roGI yGI uThr ArgP roLeuI l eLeuCysGI

2701 ATACGCCACGCGAIGGGIAACAGICTIGGCGGIIICGCIAAAIACTGGCAGGCGIICGICAGIATCCCGIICACAGGGCGGCTICGICIGGGACIGG
570 uTyrAl aHi sAl aMe tGl yAsnSer LeuGl yGl yPheAl aLys TyrTrpGl nAl aPheArgGl nTyrP roArgLeuGl nGl yGl yPheAl TTrpAspTrp
2801 GTGGATCAGTCGCTGATTAATATGATGAAAACGGCAACCCGTTACGGCGCTTACGGCGGTGATTTTGGCGATACGCCAACGATCGCCAGTTCTGTATGA
604 Val AspGl nSer LeuI l eLys TyrAspGl uAsnGl yAsnP roTrpSer Al aTyrGl yGl yAspPheGl yAspThr P roAsn AspArgGl nPheCysMe tA
Eco47III (2937)
2901 ACGGTCTGGTCTTTGCCGACCGCACGCCGATCCAGCGCTGACGGAAGCAAAACACCAGCAGCAGTTTTTCCAGTTCGGTTTATCCGGGCAAACCATCGA
637 snGl yLeuVal PheAl aAspArgThr P roHi sP roAl aLeuThr Gl uAl aLysHi sGl nGl nGl nPhePheGl nPheArgLeuSer Gl yGl nThr I l eGl
SacI (3042)
3001 AGTGACCAGCGAATACCTGTTCCGTCATAGCGATAACGAGCTCCTGCACTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCCTCTG
670 uVal Thr Ser Gl uTyrLeuPheArgHi sSer AspAsnGl uLeuLeuHi sTrpMe tVal Al aLeuAspGl yLysProLeuAl aSer Gl yGl uVal P roLeu
3101 GATGTCGCTCCACAAGGTAACAGTTGATTGAUCTGCCTGAAC TACCGCAGCCGGAGAGCGCCGGCAACTCTGGCTCACAGTACCGGTAGTGAACCGA
704 AspVal Al aP roGl nGl yLysGl nLeuI l eGl uLeuP roGl uLeuP roGl nP roGl uSer Al aGl yGl nLeuTrpLeuThr Val A rgVal Val Gl nP roA
3201 ACGCGACCGCATGGTCAGAACGCCGGCAGCATCAGCGCTGGCAGCAGTGGCGTCTGGCGGAAAACCTCAGTGTGACGCTCCCCGCCGCTCCACGCCAT
737 snAl aThr Al aTrpSer Gl uAl aGl yHi sI l eSer Al aTrpGl nGl nTrpArgLeuAl aGl uAsnLeuSer Val Thr LeuP roAl aAl aSer Hi sAl aI l
3301 CCCGATCTGACCACCGCGAAATGGATTTTTGCATCGAGCTGGGTAATAAGCGTTGGCAATTAACGCCAGTCAAGGCTTCTTTCACAGATGTGGATT
770 eP roHi sLeuThr Thr Ser Gl uMe tAspPheCysI l eGl uLeuGl yAsnLysArgT rpGl nPheAsnArgGl nSer Gl yPheLeuSer Gl nMe tTrpI l e
3401 GCGGATAAAAAACAACTGCTGACGCCGCTGCGGATCAGTTACCCGTCACCCGTCACCCGCTGGATAACGACATTTGGCGTAAGTGAAGCGACCCGATGACCTA
804 Gl yAspLysLysGl nLeuLeuThr P roLeuArgAspGl nPheThr ArgAl aP roLeuAspAsnAspI l eGl yVal Ser Gl uAl aThr ArgI l eAspP roA
3501 ACGCTGGTTCGAACGCTGGAAGCGCGCGGCCATTACAGGCCGAAGCAGCGTTGTTGCAGTGCACGGCAGATACACTTGTGATGCGGTGCTGATTAC
837 snAl aTrpVal I Gl uArgT rpLysAl aAl aGl yHi sTyrGl nAl aGl uAl aAl aLeuLeuGl nCysThr Al aAspThr LeuAl aAspAl aVal I LeuI l eTh
3601 GACCGCTCACGCTGGCAGCATCAGGGGAAAACCTTATTTATCAGCCGAAAACCTACCGGATTGATGGTAGTGGTCAAATGGCGATTACCGTTGATGTT
870 r Thr Al aHi sAl aTrpGl nHi sGl nGl yLysThr LeuPheI l eSer ArgLysThr TyrArgI l eAspGl ySer Gl yGl nMe tAl aI l eThr Val AspVal
3701 GAAGTGGCGAGCGATACCCGATCCGGCGCGGATTGGCTGAACTGCCAGCTGGCGCAGGTAGCAGAGCGGGTAAACTGGCTCGATTAGGGCCGCAAG
904 Gl uVal Al aSer AspThr P roHi sP roAl aArgI l eGl yLeuAsnCysGl nLeuAl aGl nVal Al aGl uArgVal AsnTrpLeuGl yLeuGl yProGl nG
Bst1107I (3864) BspLU11I (3861) BsiWI (3872)
3801 AAACTATCCCGACCGCCTTACTGCCGCTGTTTTGACCGCTGGGATCTGCCATTGTCCAGACATGTATACCCCGTACGCTCTCCGAGCGAAAACGGTCT
937 I uAsnTyrP roAspArgLeuThr Al aAl aCysPheAspArgT rpAspLeuP roLeuSerAspMe tTyrThr P roTyrVal I PheP roSer Gl uAsnGl yLe
3901 GCGCTGCGGGACGCGCAATTGAATTATGGCCACACCACTGGCGCGGCGACTTCCAGTTCAACATCAGCCGCTACAGTCAACAGCAACTGATGGAAACC
970 uArgCysGl yThrArgGl uLeuAsnTyrGl yP roHi sGl nTrpArgGl yAspPheGl nPheAsnI l eSer ArgTyrSer Gl nGl nGl nLeuMe tGl uThr
NdeI (4059)
4001 AGCCATCGCCATCTGCTGCACGCGGAAGAAGGCACATGGCTGAATATCAGCGTTTCCATATGGGGATTGGTGGCGACACTCTGGAGCCCGTCACTAT
1004 Ser Hi sArgHi sLeuLeuHi sAl aGl uGl uGl yThr TrpLeuAsnI l eAspGl yPheHi sMe tGl yI l eGl yGl yAspAspSer TrpSer P roSer Val I S
NheI (4181) EcoRI (4175)
4101 CGGCGAAT TACAGCTGAGCGCCGCTGCTACCATTACAGTTGGTCTGGTGTCAAAAATAATAATCTAGTCGAGAATTCGCTAGCTCGACATGATAAGA
1037 er Al aGl uLeuGl nLeuSer Al aGl yA rgTyrHi sTyrGl nLeuVal I TrpCysGl nLys ●●●
4201 TACATTGATGAGTTTGGACAAACCACAAC TAGAATGCAGTGAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTGAAATTTGTGA
MfeI (4355)
4301 TGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAAAACAAGTTAAACAACAACAATTCGATTCATTTATGTTTCAGGTTCAAGGGGAGGTGTGGAG
DraI (4404) DraI (4443) SwaI (4446)
4401 GTTTTTAAAGCAAGTAAACCTCTACAATGTGGTAGATCCATTTAAATGTTAATTAAGTAACTAGCCATGACCAAAATCCCTAACGTGAGTTTTCGTTCCA
4501 CTGAGCGTCAGACCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTCTGCGCGTAATCTGCTGCTTGC AAAA AAAAAACCACCGCTACCA
4601 GCGGTGGTTTGTTCGCCGATCAAGAGCTACCAACTCTTTTTCCGAAGTAACCTGGCTTACGAGAGCGCAGATACCAAACTACTGTTCTTAGTGTAGC
4701 CGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCGCTACATACCTCGCTCTGCTAATCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCTGTG
4801 TCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTGCGGCTGAACGGGGGTTCTGTCACACAGCCAGCTTGGAGCGAACGACC
4901 TACACCGAACTGAGATACTACAGCGTGAGCTATGAGAAAAGCGCCACGCTTCCGAAGGGAGAAAAGGCGGACAGGTATCCGGTAAAGCGGCAGGGTCCGAA
5001 CAGGAGAGCGCAGAGGGAGCTTCCAGGGGAAAACGCCTGGTATCTTTATAGTCTGTGCGGTTTCGCCACTCTGACTTGAGCGTCGATTTTTGTGATG
BspLU11I (5184)
5101 CTCGTCAGGGGGCGGAGCCTATGAAAAACGCCAGCAACCGGCTTTTTACGGTCTGCGCTTTTGTGCGCTTTTGTCCACATGTTCTTAATTA
AseI (5222) SfiI (5273) MscI (5284)
5201 TTTTTCAAAGTAGTTGACAATTAATCATCGGCATAGTATATCGGCATAGTATAATACGACTCACTATAGGAGGGCCATCATGGCCAAGTTGACCAAGTGC
5301 TGTCCCAGTGTCTACAGCCAGGGATGTGGCTGGAGCTGTTGAGTTCTGGACTGACAGGTTGGGGTCTCCAGAGATTTTGTGGAGGATGACTTTGCAGGT
7 aVal P roVal LeuThr Al aArgAspVal Al aGl yAl aVal I Gl uPheTrpThr AspArgLeuGl yPheSer ArgAspPheVal I Gl uAspAspPheAl aGl y
5401 GTGGTCAGAGATGATGTACCCTGTTTCTCAGCAGTCCAGGACCAGGTGGTGCCTGACAACACCCTGGCTTGGGTGGGTGAGAGGACTGGATGAGC
41 Val Va I A rgAspAspVal Thr LeuPheI l eSer Al aVal I Gl nAspGl nVal Val I P roAspAsnThr LeuAl aTrpVal I TrpVal I A rgGl yLeuAspGl uL
5501 TGTATGCTGAGTGGAGTGGTGGTCTCCACCAACTTCAGGGATGCCAGTGGCCCTGCCATGACAGAGATTGGAGAGCAGCCCTGGGGGAGAGAGTTTGC
74 euTyrAl aGl uTrpSer Gl uVal Val Ser Thr AsnPheArgAspAl aSer Gl yP roAl aMe tThr Gl uI l eGl yGl uGl nP roTrpGl yA rgGl uPheAl
DraIII (5634)
5601 CCTGAGAGACCCAGCAGGCAACTGTGTGCACTTTGTGGCAGAGGAGCAGGACTGAGGATAAGAATTGTAACAAAAACCCCGCCCGGGGTTTTTGTG
107 aLeuArgAspP roAl aGl yAsnCysVal Hi sPheVal Al aGl uGl uGl nAsp ●●●
5701 TTAATTA

