



SdaI (6)
1 CCTGCAGGTGAAGACGTTACACAAGTAACATGAGAAAGCAGAAAATGCAGGTCATCCACGCACCCCTGACCCAGGCCAGCAGGGCGGGCTGCAGCATCAG
101 TACACAGGAGAAAGATCCTTATTCTAAGAATGAGAAAGCAAAGGCCCGATAGAATAAATTAGCATAGAAGGGGCTTTCCAGGAGTTAAAACCTTC

AvrII (251)
201 CTTCTGAGCGATTACCTACTAAAACCAGGGCTTTTGCCCACTACCATTACCTAGGATCTTGGCTTGACGGATTATAGGGGCATATCCCTCCCCCTCT

AvrII (337)
301 TCTTTAGAGTCGTTCTTAAAAGATCGCTCTCCACGCCCTAGGCAGGGAAAACGACAAAATCTGGCTCAATTCAGGCTAGAACCCTACAAATTCACAGG

EcoRV (403)
401 GATATCGCAAGGATACTGGGCATACGCCACAGGGAGTCCAAGAATGTGAGGTGGGGGTGGCGAAGGTAATGTCTTTGGTGTGGAAAAAGCAGCAGCCAT
501 CTGAGATAGAACTGAAAAACAGAGGAGAGCGCTTCAGGAAGATTATGGAGGGGAGGACTGGGCCCCACAGCGACCAGAGTTGTACAAGGCCGCAA
601 GAACAGGGGAGGTGGGGGCTCAGGGACAGAAAAAAGTATGTGTATTTGAGAGCAGGGTTGGGAGGCCTCTCTGAAAAGGTATAAACGTGGAGTA

SalI (785)
701 GGCAATACCCAGGCAAAAAGGGGAGACCAGAGTAGGGGGAGGGGAAGAGTCTGACCCAGGGAAGACATTA AAAAGGTAGTGGGGTCGACTAGATGAAGG
801 AGAGCCTTCTCTCTGGCAAGAGCGGTGCAATGGTGTGTAAGGTAGCTGAGAAGACGAAAAGGGCAAGCATCTTCTGCTACCAGGCTGGGGAGGCC
901 AGGCCACGACCCGAGGAGAGGGAACGAGGGAGACTGAGGTGACCCTTCTTCCCCGGGGCCGGTCTGTGGTTCGGTGTCTTTTCTGTTGGAC

XhoI (1075)
1001 CTTACCTTGACCCAGCGCTGCCGGGCTGGGCCGGGCTGCGGCGACGGCACTCCCGGAGGCAGCGAGACTCGAGTTAGGCCAACGCGCGCCCA
1101 CGCGCTTCTCTGGCCGGAATGCCCGTACCCTGAGGTGGGGTGGGGGCGAGAAAAGCGGAGCGAGCCCGAGGCGGGGAGGGGAGGCCAGGGGCC

NotI (1275)
1201 GAGGGGGCCGGCACTACTGTGTGGCGGACTGGCGGACTAGGGCTGCGTGAGTCTCTGAGCGAGCGGGCGCGCCCTCCCCGGCGGGCGCA
1301 CGCGGGCAGCGGGCAGCTCACTCAGCCCGTCCCGAGCGGAAACGCCACTGACCGCACGGGATTCCAGTGCCGGCGCCAGGGGCACGGGGACA
1401 CGCCCCCTCCCGCGCGCCATTGGCTCTCCGCCACCGCCCCACACTTATTGGCCGGTGCGCCCAATCAGCGGAGGCTGCCGGGGCCGCTAAAGAA

NotI (1600)
1501 GAGGCTGTGCTTTGGGGCTCCGGCTCTCAGAGAGCCTCGGCTAGGtaggggatcgggactctggcgggagggcggttggtgctgttgcggggaagggg
1601 ggccgcgagcagccctccgagcgtggtggagccgttctgtgagacagccgggtacgagtcgtgacgctggaaggggcaagcgggtggtgggagggaatgc

NcoI (1765)
1701 ggtccgacctgcagcaaccggaggggggagggagaagggagcggaaaagtctccaccggagcggccatggctcggggggggggggcagcggaggagcgc
1801 ttccggccgagctctcgtcgtgattggcttctttctcccgctgtgtgaaaacacaattgtactaaccttcttctcttctctcctcgtgacagGTGT

AgeI (1915) **BspHI (1931)** **NheI (1969)**
1901 GAAACAGGAAGAGAACCCGGTAGGAGGCCATCATGAGCGGTTCTCATCATCATCATCATGGTATGGCTAGCATGCTGGAGCAGCAAATGGGTGC
1 MetSer Gl ySer Hi sHi sHi sHi sHi sHi sGl yMeAl aSer MeThr Gl yGl yGl nGl nMeTl yAr

Bsu36I (2030)
2001 GGATCTGTACGACGATGACGATAAGGTACCTAAGGATCAGCTTGAGGTTGATCCCGTCTTTTACAACGTCGTGACTGGGAAAAACCTGGCGTTACCCAA
23 gAspLeuTyrAspAspAspLysValProLysAspGlnLeuGlyValAspProValValLeuGlnArgArgAspTrpGluAsnProGlyValThrGln
2101 CTTAATCGCCTTGACGACATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCGACCAGTCCGCTTCCCAACAGTTGCGCAGCCTGAATGGCG
57 LeuAsnArgLeuAlaAlaHisProProPheAlaSerTrpArgAsnSerGluGluAlaArgThrAspArgProSerGlnLeuArgSerLeuAsnGlyG

Bsu36I (2267)
2201 AATGGCGCTTTGCTGGTTCCGGCACCAGAAGCGGTGCGGAAAGCTGGCTGGAGTGCATCTTCTGAGGCCGATACTGTGCTGCTCCCTCAAACCTG
90 IuTrpArgPheAlaTrpPheProAlaProGluAlaValProGluSerTrpLeuGluCysAspLeuProGluAlaAspThrValValValProSerAsnTr
2301 GCAGATGCACGGTTACGATGCGCCATCTACACCAACGTAACCTATCCATTACGGTCAATCCGCGTGTGTTCCACGGGAGAATCCGACGGGTTGTTAC
123 pGlnMetHisGlyTyrAspAlaProIleTyrThrAsnValThrTyrProIleThrValAsnProProPheValProThrGluAsnProThrGlyCysTyr
2401 TCGCTCATTAAATGTTGATGAAAGCTGGCTACAGGAAGGCCAGACGCAATTATTTTATGATGGCGTTAACTCGGCGTTTCATCTGTGGTGAACGGGC
157 SerLeuThrPheAsnValAspGluSerTrpLeuGlnGluGlyGlnThrArgIleIlePheAspGlyValAsnSerAlaPheHisLeuTrpCysAsnGlyAla
2501 GCTGGTTCGGTTACGGCCAGGACAGTGTGTTGCCGTCTGAATTTGACCTGAGCGCATTTTACGCGCGGAGAAAACCCCTCGCGGTGATGGTGGC
190 rGTrpValGlyTyrGlyGlnAspSerArgLeuProSerGluPheAspLeuSerAlaPheLeuArgAlaGlyGlyAsnArgLeuAlaValMetValLeuAr
2601 TTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGATGAGCGGCAATTTCCGTGACGCTCGTTGCTGCATAAACGACTACACAAATCAGC
223 gTrpSerAspGlySerTyrLeuGluAspGluAspMetTrpArgMetSerGlyIlePheArgAspValSerLeuLeuHisLysProThrThrGlnIleSer
2701 GATTTCCATGTTGCCACTCGCTTAATGATGATTTTCAGCGCGCTGTACTGGAGCTGAAGTTGAGTTGAGTTGAGTTGAGTTGAGTTGAGTTGAGTTGAGTT
257 AspPheHisValAlaThrArgPheAsnAspPheSerArgAlaValLeuGluAlaGlyValGlnMetCysGlyGlyLeuArgAspTyrLeuArgValT
2801 CAGTTTCTTTATGGCAGGTGAAACGACAGTCCGCCAGCGGCACCGCCCTTTCCGCGGTGAAATATCGATGAGCGTGGTGGTTATGCCGATCGGCTCAC
290 hrValSerLeuTrpGlnGlyGlyThrGlnValAlaSerGlyThrAlaProPheGlyGlyGlyIleIleAspGluArgGlyGlyTyrAlaAspArgValTh
2901 ACTACGCTGAACGTCGAAAACCCGAAACTGTGGAGCGCCGAAATCCGAATCTCTATCGTGGTGGTGGTGGTGGTGGTGGTGGTGGTGGTGGTGGTGGT
323 rLeuArgLeuAsnValGluAsnProLysLeuTrpSerAlaGlyIleProAsnLeuTyrArgAlaValValGluLeuHisThrAlaAspGlyThrLeuIle
3001 GAAGCAGAAGCTGCGATGTCGTTTCCGCGAGGTGCGGATTGAAAATGGTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT
357 GluAlaGluAlaCysAspValGlyPheArgGluValArgIleGluAsnGlyLeuLeuLeuLeuAsnGlyLysProLeuLeuIleArgGlyValAsnArgH

EcoRV (3156)
3101 ACGAGCATCATCTCTGCATGGTCAGGTCATGGATGAGCAGACGATGGTGCAGGATATCTGCTGATGAAGCAGAACTTTAACGCCGTGCGCTGTC
390 i sGluHi sHisProLeuHisGlyGlyValMetAspGluGlnThrMetValGlnAspIleLeuLeuMetLysGlnAsnAsnPheAsnAlaValArgCysSe

3201 GCATTATCCGAACCTCCGCTGTGGTACACGCTGTGCGACCCTACGGCCTGTATGTGGTGGATGAAGCCAATATTGAAACCCACGGCATGGTGCCAATG
423▶ r Hi s Tyr P ro Asn Hi s P ro Leu T rp Tyr Thr Leu Cys Asp Arg Tyr Gl y Leu Tyr Val Va l Asp Gl u Al a Asn I l e Gl u Th r Hi s Gl y Me t Va l P ro Me t
3301 AATCGTCTGACCAGTATCCGCGCTGCTACCGCGATGAGCGAACCGCTAACCGCAATGGTGCAGCGCATCGTAATACCCGAGTGTGATCATCTGGT
457▶ Asn Arg Leu Thr Asp Asp P ro Arg T rp Leu P ro Al a Me t Ser Gl u Arg Va l Thr Arg Me t Va l Gl n Arg Asp Arg Asn Hi s P ro Ser Va l I l e I l e T rp S
3401 CGCTGGGAATGAATCAGGCACCGCCGCTAATCACGACGCGTGTATCGTGGATCAAATCTGTCTGATCCTTCCC GCCGGTGCAATGAAAGCGGGC
490▶ er Leu Gl y Asn Gl u Ser Gl y Hi s Gl y Al a Asn Hi s Asp Al a Leu Tyr Arg T rp l l e Lys Ser Va l Asp P ro Ser Arg P ro Va l Gl n Tyr Gl u Gl y Gl y
3501 AGCCGACACCGCCACCGATATTATTTGCCGATGTACGCGCGCTGGATGAAGACCAGCCCTTCCC GGCTGTGCCAAATGGTCCATCAAAAAATGG
523▶ y Al a Asp Thr Thr Al a Thr Asp l l e l l e Cys P ro Me t Tyr Al a Arg Va l Asp Gl u Asp Gl n P ro Phe P ro Al a Va l P ro Lys T rp Ser I l e Lys Lys T rp
3601 CTTTCGTACCTAGGAGAGCCGCCCGCTGATCCTTTGCGAATACGCCACGCGATGGTAAACAGTCTTGGCGTTTCCGCTAAATACCTGGCAGCGTTC
557▶ Leu Ser Leu P ro Gl y Gl u Th r Arg P ro Leu l l e Leu Cys Gl u Tyr Al a Hi s Al a Me t Gl y Asn Ser Leu Gl y Gl y Phe Al a Lys Tyr T rp Gl n Al a Phe A
3701 GTCAGTATCCCCGTTTACAGGGCGGCTTCGCTGGGACTGGGTGGATCAGTCTGATTAATATGATGAAAACGGCAACCCGTGGTCCGCTTACGGCGG
590▶ r g l n Tyr P ro Arg Leu Gl n Gl y Gl y Phe Va l T rp Asp T rp Va l Asp Gl n Ser Leu l l e Lys Tyr Asp Gl u Asn Gl y Asn P ro T rp Ser Al a Tyr Gl y Gl y
3801 TGATTTGGGATACCGCAACCGCCTGCTGATGATGATCGCTGCTGACCAAGGTAACAGTCTTGGCAGCCGCGGATCCAGCGCGGAGCAAAACAGCAG
623▶ y Asp Phe Gl y Asp Thr P ro Asn Asp Arg Gl n Phe Cys Me t Asn Gl y Leu Va l Phe Al a Asp Arg Thr P ro Hi s P ro Al a Leu Thr Gl u Al a Lys Hi s Gl n
3901 CAGCAGTTTTTCCAGTTCGGTTATCCGGGCAAACCATCGAAGTGACCGCAATACCTGTTCCGCTATAGCGATAACGAGCTCTCGACTGGATGGTGG
657▶ Gl n Gl n Phe Phe Gl n Phe Arg Leu Ser Gl y Gl n Thr I l e Gl u Va l Thr Ser Gl u Tyr Leu Phe Arg Hi s Ser Asp Asn Gl u Leu Leu Hi s T rp Me t Va l A
4001 GGATGGATGGTGGTGGTCAATGGCGATACCGCTGATGCTGCTCACAAGGTAACAGTGGATTGATTGAACTGGATTTCGATGAGCTGGAGCGGAGAG
690▶ l a Leu Asp Gl y Lys P ro Leu Al a Ser Gl y Gl u Va l P ro Leu Asp Va l Al a P ro Gl n Gl y Lys Gl n Leu l l e Gl u Leu P ro Gl u Leu P ro Gl n P ro Gl u Se
4101 CGCCGGCAACTCTGGCTACAGTACCGTGTGAACCGAACCGCAGCCGATGGTCAGAAGCCGGGCACATCAGCGCTGGCAGCAGTGGCGTCTGGCG
723▶ r Al a Gl y Gl n Leu T rp Leu Thr Va l A rg Va l Va l Gl n P ro Asn Al a Thr Al a T rp Ser Gl u Al a Gl y Hi s l l e Ser Al a T rp Gl n Gl n T rp Arg Leu Al a
4201 GAAAACCTCGTGGTGGTCAATGGCGATCCCGCGCTCCCGCATCCGCTGATGCTGCTCACAAGGTAACAGTGGATTGAACTGGATTTCGATGAGCTGGAGCGGAGAG
757▶ Gl u Asn Leu Ser Va l Thr Leu P ro Al a Al a Ser Hi s Al a l l e P ro Hi s Leu Thr Thr Ser Gl u Me t Asp Phe Cys l l e Gl u Leu Gl y Asn Lys Arg T rp G
4301 AATTTAACCGCCAGTCCAGCTTTTCTTACAGATGTGGATTGGCGATAAAAACAACTGCTGACGCCGCTGCAGCAGTACCTACCCTGACCCGCTGGG
790▶ l n Phe Asn Arg Gl n Ser Gl y Phe Leu Ser Gl n Me t T rp l l e Gl y Asp Lys Lys Gl n Leu Leu Thr P ro Leu Arg Asp Gl n Phe Thr Arg Al a P ro Leu As
4401 TAACGACATTGGCGTAAGTGAAGCGACCCGATTGACCTAACCGCTGGGTGCAACGCTGGAAGCGGGCGGGATTACAGGCGGAGCAAGCGTTGTG
823▶ p Asn Asp l l e Gl y Va l Ser Gl u Al a Thr Arg l l e Asp P ro Asn Al a T rp Va l Gl u Arg T rp Lys Al a Al a Gl y Hi s Tyr Gl n Al a Gl u Al a Al a Leu Leu
4501 CAGTGCACCGCAGATACACTTGTGTGTGCTGATTACGACCGCTCACGCTGGCAGCATCAGGGGAAAACCTTATTTATCAGCCGGAAAACCTACC
857▶ Gl n Cys Thr Al a Asp Thr Leu Al a Asp Al a Va l Leu l l e Thr Thr Al a Hi s Al a T rp Gl n Hi s Gl n Gl y Lys Thr Leu Phe l l e Ser Arg Lys Thr Tyr A
4601 GGATTGATGGTGGTGGTCAAATGGCGATTACCGTTGATGTTGAAGTGGCGAGCGATACCCGCTCCGGCGGGATTGGCTGAACCTGCCAGCTGGCGCA
890▶ r gl l e Asp Gl y Ser Gl y Gl n Me t Al a l l e Thr Va l Asp Va l Gl u Va l Al a Ser Asp Thr P ro Hi s P ro Al a Arg l l e Gl y Leu Asn Cys Gl n Leu Al a Gl
4701 GGTAGCAGAGCGGTAAACTGGCTCGGATTAGGGCCGCAAGAAAACCTATCCCGACCGCTTACTGCCGCTGTTTTGACCGCTGGGATCTGCCATTTGCA
923▶ n Va l Al a Gl u Arg Va l Asn T rp Leu Gl y Leu Gl y P ro Gl n Gl u Asn Tyr P ro Asp Arg Leu Thr Al a Al a Cys Phe Asp Arg T rp Asp Leu P ro Leu Ser
BspLU11I (4802)
4801 GACATGTATACCCCGTACGTTTCCCGAGCGAAAACGGTCTGCGCTGCGGGACGCGGAATTAATGATGGCCACACAGTGGCGGGCGACTTCCAGT
957▶ Asp Me t Tyr Thr P ro Tyr Va l Phe P ro Ser Gl u Asn Gl y Leu Arg Cys Gl y Thr Arg Gl u Leu Asn Tyr Gl y P ro Hi s Gl n T rp Arg Gl y Asp Phe Gl n P
4901 TCAACATCAGCCGCTACAGTCAACAGCAACTGATGAAACCAGCCATCGCATCTGCTGACCGGAAGAAGGCACATGGTGAATATCAGCGTTTCCA
990▶ he Asn l l e Ser Arg Tyr Ser Gl n Gl n Gl n Leu Me t Gl u Thr Ser Hi s Arg Hi s Leu Leu Hi s Al a Gl u Gl u Gl y Thr T rp Leu Asn l l e Asp Gl y Phe Hi
5001 TATGGGATTGGTGGCGACTCTGGAGCCGCTCAGTATCGGCGAATACAGCTGAGCGCGGTCTGCTACCATTACCAGTTGGTCTGGTGTCAAAAA
1023▶ s Me t Gl y l l e Gl y Gl y Asp Asp Ser T rp Ser P ro Ser Va l Ser Al a Gl u Leu Gl n Leu Ser Al a Gl y Arg Tyr Hi s Tyr Gl n Leu Va l T rp Cys Gl n Lys

NheI (5122)
EcoRI (5116)

5101 TAATAATCTAGTCGAGAATTCGCTAGCTCGACATGATAAGATACATTGATGAGTTTGGACAAACCACTAGAATGCAGTGAAAAAATGCTTTATTTG
1057▶ ●●●
5201 TGA AATTTGTGATGCTATTGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAAACAAGTTAACAACAACAATT

SwaI (5387)

5301 GCATTCAATTTTATGTTTCAGGTTTCAGGGGAGGTTGGGAGGTTTTTAAAGCAAGTAAACCTCTACAAATGTGGTATGATCCATTTAAATGTTAATTA
5401 CTAGCCATGACCAAAATCCCTTAACGTGAGTTTTGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGGATCCTTTTTTTCTGC
5501 CGCTAATCTGCTGTTGCAAAACAAAAAACCCGCTACCAGCGGTGGTTTTGTTGCCGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACCTGGCTT
5601 CAGCAGAGCGCAGATACCAATACTGTTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCGCTACATACCTCGCTCTGCTA
5701 ATCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCTGTCTTACCGGTTGGACTCAAGACGATAGTTACCGGATAAGGGCGAGCGGTGGGCTGAA
5801 CGGGGGTTCGTGCACACAGCCAGCTTGGAGCGAAGCCTACACCGAACTGAGATACTACAGCGTGAAGTATGAGAAAAGCGCCAGCTTCCGGAAGG
5901 GAGAAAAGCGGACAGGTATCCGTAAGCGGCGAGGTTCGGAACAGGAGCGCAGAGGGAGCTTCCAGGGGAAAACCGCTGGTATCTTTATAGTCTGTCT
6001 GGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCTGAGGGGGCGGAGCCTATGAAAAACGCCAGAACGCGGCTTTTTACGGTTCC

BspLU11I (6125) **AseI (6163)**

6101 TGGCCTTTTCTGCTGGCCTTTTCTCACATGTTCTTAATTAATTTTTCAAAGTAGTTGACAATTAATCATCGGCATAGTATATCGGCATAGTATAATACG
6201 ACTCACTATAGGAGGGCCATCATGGCCAAGTTGACCAAGTGTGCTCCAGTGTCCAGTGTCCAGCCAGGATGTGGCTGGAGCTGTTGAGTCTGGACTGACAGGT
1▶ Me t Al a Lys Leu Thr Ser Al a Va l P ro Va l Leu Thr Al a Arg Asp Va l Al a Gl y Al a Va l Gl u Phe T rp Thr Asp Arg L
6301 TGGGTTCTCCAGAGATTTGTGGAGGATGACTTTGACAGGTGCTGAGAGATGTACACCTGTTTCATCTCAGCAGTCCAGGACCAAGTGGTGGCTGA
27▶ eu Gl y Phe Thr Arg Asp Phe Va l Gl u Asp Asp Phe Al a Gl y Al a Va l A rg Asp Asp Va l Thr Leu Phe l l e Ser Al a Va l Gl n Asp Gl n Va l P ro As
6401 CAACACCTGGCTTGGGTGGTGGTGAGAGGACTGGATGAGCTGTATGCTGAGTGGAGTGGTGGTCTCCACCAACTTCCAGGATGCCAGTGGCCCTGCC
60▶ p Asn Thr Leu Al a T rp Va l T rp Va l A rg Gl y Leu Asp Gl u Leu Tyr Al a Gl u T rp Ser Gl u Va l Va l Ser Thr Asn Phe Arg Asp Al a Ser Gl y P ro Al a
6501 ATGACAGAGATTTGGAGAGCAGCCCTGGGGAGAGAGTTTGCCCTGAGAGACCCAGCAGCAACTGTGTGCACTTTGTGGCAGAGGAGCAGGACTGAGGAT
94▶ Me t Thr Gl u l l e Gl y Gl n P ro T rp Gl y A rg Gl u Phe Al a Leu A rg Asp P ro Al a Al a Gl y Asn Cys Va l Hi s Phe Va l Al a Al a Gl u Gl u Gl n Asp ●●●
6601 AAGAATTGAGTTTCAGAAAAGGGGCGCTGAGTGGCCCTTTTTCAACTAATTA