



SdaI (7) SpeI (14)

1 CCTGCAGGCCACTAGTGGAGCCGAGAGTAATTCATACAAAAGGACTCGCCCTGCCTTGGGGAATCCCAGGGACCGTCGTTAAACTCCCACTAACCTA
101 GAACCCAGAGATCGCTGCGTTCCCGCCCCCTCACCCGCCCGCTCTCGTCATCACTGAGGTGGAGAAGAGCATGCGTGAGGCTCCGGTCCCGTCAGTGGG
201 CAGAGCGCACATCGCCACAGTCCCCGACAAGTTGGGGGAGGGGTTCGCAATTGAACCGGTGCCTAGAGAAGGTGGCGGGGTAACCTGGGAAAGTGA
301 TGTGCTGTACTGCTCCGCCTTTTTCCCGAGGGTGGGGGAGAACCGTATATAAGTGCAGTAGTCGCCGTGAACGTTCTTTTTCGCAACGGGTTTCCCGCC
401 AGAACACAGgtaagtgcctgtgtggttcccgcgggctggcctctttacgggttatggccttgcgtgccttgaattacttccatgccttgcctgagc
501 tacgtgatcttgatcccagcttcgggttgggaagtgggtgggagagttcgaggccttgccttaaggagcccttgcctcgtgcttgagttgagcct
601 ggcttgggcgctggggccgcccgtgctaatctggtggcaccttcgcgctgtctcgtgcttctgctaagtctctagccatttaaaatttttgataacc

BglII (750)

701 agctgcgacgcttttttctggcgagatagtcttgtaaatgcgggccaagatctgcacactggatatttcggtttttggggccgcccggcgacggggcc
801 cgtgcgtcccagcgcacatgctcggcgaggcggggcctgcgagcggccaccgagaatcggacggggtagtctcaactggccggcctgctctggtgc
901 ctggcctcgcgccctgtatcgccccccctggggcgcaaggctggcccgtcggcaccagttgcgtgagcggaaagatggccgcttcccggcctgc
1001 tgcaggagctcaaaatggaggacgcccgggagagcggggcggtgagtcaaacacaaaggaaaaggccttcttctcatccgtcgcttca

XhoI (1149)

1101 tgtgactccacggagtaccgggcccgtccaggcacctcgattagttctcgagctttggagtacgtcgtctttaggttggggggagggttttatgcga
1201 tggagtttccccacactgagtggtggagactgaagagttaggcagccttggcacttgatgtaattctccttgaatttgcctttttgagtttggatct

NcoI (1384)

1301 tgcctcattctcaagcctcagacagtggttcaagttttttcttccatttcagGTGTCGTGAAAACCTACCCTAAAAGCCACCATGGGGGGTCTCATC
1401 ATCATCATCATATGGTATGGCTAGCATGACTGGTGACAGCAAATGGGTCCGGATCTGTACGACGATGACGATAAGGTACCTAAGGATCAGCTGGAGT
6 isHisHisHisHisGlyMetAlaSerMetThrGlyGlyGlnGlnMetGlyArgAspLeuTyrAspAspAspLysValProLysAspGlnLeuGlyVa
1501 TGATCCCCTCGTTTACACGCTCGTACTGGGAAAACCCCTGGCGTTACCAACTTAATCGCCTTGCAGCACATCCCCTTTCGCCAGCTGGCGTAATAGC
39 IAspProValValLeuGlnArgArgAspTrpGluAsnProGlyValThrGlnLeuAsnArgLeuAlaHisProPheAlaSerTrpArgAsnSer
1601 GAAGAGGCCCGCACCGATCCCTCCCAACAGTTGGCAGCCTGAATGGCAATGGCGCTTTCGCTGGTTCGCGCACCAGAGCGGTCGGGAAAGCT
73 GluGluAlaArgThrAspArgProSerGlnGlnLeuArgSerLeuAsnArgGluTrpArgPheAlaTrpPheProAlaProGluAlaValProGlyGlnTr
1701 GGCTGGAGTGGATCTTCTGAGGCCGATACTGTCGTCGTCCTCAAACTGGCAGATGCACGGTTACGATGCGCCATCTACCAACGTAACCTATCC
106 rpLeuGluCysAspLeuProGluAlaAspThrValValValProSerAsnTrpGlnMetHisGlyTyrAspAlaProI leTyrThrAsnValThrTyrPr
1801 CATTACGCTCAATCCGCGTTCGTTCCACGGAGAATCCGACGGTGTACTCGCTCACATTAATGTTGATGAAAGCTGGCTACAGGAAGCCAGACG
139 ol leThrValAsnProProPheValProThrGluAsnProThrGlyCysTyrSerLeuThrPheAsnValAspGluSerTrpLeuGlnGlyGlnTr
1901 CGAATTATTTTTGATGGCGTTAACTCGCGTTCATCTGTGGTGAACGGGCGCTGGGTTCGTTACGGCCAGGACAGTCTTTGCGCTGTAATTTGACC
173 ArgI leI lePheAspGlyValAsnSerAlaPheHisLeuTrpCysAsnGlyArgTrpValGlyTyrGlyGlnAspSerArgLeuProSerGluPheAspL
2001 TGAGCGCATTTTTACGCGCCGAGAAAACCCCTCGCGGTGATGGTGTGCGTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGATGAG
206 euSerAlaPheLeuArgAlaGlyGluAsnArgLeuAlaValMetValLeuArgTrpSerAspGlySerTyrLeuGluAspGlnAspMetTrpArgMetSe
2101 CGGCATTTCCGTGACGCTCTCGTTGCTGCAAAAACCGACTACACAACTCAGCGATTCCATGTTGCCACTCGCTTAATGATGATTCAGCCGCGCTGA
239 rGlyI lePheArgAspValSerLeuLeuHisLysProThrThrGlnI leSerAspPheHisValAlaThrArgPheAsnAspAspPheSerArgAlaVal
2201 CTGGAGGCTGAAGTTCAGATGTCGGCGAGTTCGCTGACTACCTACGGTAACAGTTTCTTTATGGCAGGGTGAAAACGCGAGTCCCGCAGCCGCGCC
273 LeuGluAlaGluValGlnMetCysGlyGluLeuArgAspTyrLeuArgValThrValSerLeuTrpGlnGlyGluThrGlnValAlaSerGlyThrAlaP
2301 CTTTCGGCGGTGAAATTACGATGAGCGTGGTGGTATGCGGTACACTGCTGACACTGCTGAACGTCGAAAACCGAACCTGTGAGCGCGGAAATCCC
306 roPheGlyGlyGluI leI leAspGluArgGlyGlyTyrAlaAspArgValThrLeuArgLeuAsnValGluAsnProLysLeuTrpSerAlaGluI lePr
2401 GAATCTCTATCGTGGTGGTGAAGTGCACACCCGCGACGGCAGCGTATTGAAGCAGAAGCCTGCGATGTCGTTTCGCGAGGTGCGGATGAAAAT
339 oAsnLeuTyrArgAlaValValGluLeuHisThrAlaAspGlyThrLeuI leGluAlaGluAlaCysAspValGlyPheArgGluValArgI leGluAsn
2501 GGTCTGCTGCTGAACGGCAAGCCGTGCTGATTCGAGGCGTTAACCGTCACGAGCATCATCTCTGTCATGGTCAGGTCATGGATGAGCAGACGATGG
373 GlyLeuLeuLeuAsnGlyLysProLeuLeuI leArgGlyValAsnArgHisGluHisHisProLeuHisGlyGlnValMetAspGluMetAspGlnTrMetV
2601 TGCAGGATATCTGCTGATGAAGCAGAACAACCTTAAACCGCGTGGCTGTTCCGATTATCGAACCATCCGCTGTGGTACACGCTGTGGCACCCTACGG
406 alGlnAspI leLeuLeuMetLysGlnAsnAsnPheAsnAlaValArgCysSerHisTyrProAsnHisProLeuTrpTyrThrLeuCysAspArgTyrGI
2701 CCTGTATGTGGTGGATGAAGCAATATTGAAACCCACGGCATGGTGCCATGAATCGTCTGACCGATGATCCGCGCTGGTACCGGCGATGAGCGAACGC
439 yLeuTyrValValAspGluAlaAsnI leGluThrHisGlyMetValProMetAsnArgLeuThrAspAspProArgTrpLeuProAlaMetSerGluArg
2801 GTAACCGAATGGTGCAGCGCATCGTAATCACCCGAGTGTGATCATCTGGTCGCTGGGAAATGAATCAGGCCACCGCGTAATCACGACGCGCTGTATC
473 ValThrArgMetValGlnArgAspArgAsnHisProSerValI leI leTrpSerLeuGlyAsnGluSerGlyHisGlyAlaAsnHisAspAlaLeuTyrA
2901 GCTGGATCAAATCTGTCGATCCTCCCGCCCGTGCAGTATGAAGCGCGGAGCCGACACCAGCCACCGATATTATTGCCCCGATGTACCGCGCGCT
506 rgTrpI leLysSerValAspProSerArgProValGlnTyrGluGlyGlyAlaAspThrThrAlaThrAspI leI leCysProMetTyrAlaArgVa
3001 GGATGAAGACCAGCCCTTCCGCGCTGCGCGAAATGGTCCATCAAAAATGGCTTTCGCTACCTGGAGAGACGCGCCCGCTGATCCTTTGCGAATACGCC
539 IAspGluAspGlnProPheProAlaValProLysTrpSerI leLysLysTrpLeuSerLeuProGlyGluThrArgProLeuI leLeuCysGluTyrAla
3101 CACGCGATGGGTAAACGTCCTGGCGTTCGCTAAATACGAGGCGTTCGTCAGTATCCCCTTTACAGGGCGGCTTCGCTGGGACTGGGTGGATC
573 HisAlaMetGlyAsnSerLeuGlyGlyPheAlaLysTyrTrpGlnAlaGlyHisGlnTrpProArgLeuGlnGlyGlyPheValTrpAspTrpValAspG
3201 AGTCGCTAATTAATATGATAAAAACCGCAACCCGTCGGCTACCGGCTTACCGGCTGATTTTGGCGATACGCGCAACGATCCGCAATCTGTATGAACGGTCT
606 InSerLeuI leLysTyrAspGluAsnGlyAsnProTrpSerAlaTyrGlyGlyAspPheGlyAspThrProAsnAspArgGlnPheCysMetAsnGlyLe
3301 GGTCTTTCCGACCCGACCCGATCCAGCGCTGACGGAAGCAAAAACCCAGCAGCAGTTTTTCCAGTTCGCTTTATCCGGCAAAACCATCGAAGTGACC
639 uValPheAlaAspArgThrProHisProAlaLeuThrGluAlaLysHisGlnGlnPhePheGlnPheArgLeuSerGlyGlnThrI leGluValThr
3401 AGCGAATACCTGTTCCGTCATAGCGATAACGAGCTCCTGCATGGATGGCGCTGGTGGTAAGCCGCTGGCAAGCGGTGAAGTCCCTCTGGATGTCG
673 SerGluTyrLeuPheArgHisSerAsnGluLeuHisTrpMetValAlaLeuAspGlyLysProLeuAlaSerGlyLysProLeuAlaValProLeuAspValA
3501 CTCACAAGGTAACAGTTGATTGAACTGCCTGAACTACCCGAGCCGAGAGCCGCGGCAACTCTGGCTCACAGTACCGTAGTGAACCGAACCGGAC
706 IaProGlnGlyLysGlnLeuI leGluLeuProGluLeuProGlnProGluSerAlaGlyGlnLeuTrpLeuThrValArgValValGlnProAsnAlaTh

3601 CGCATGGTCAGAAGCCGGGCACATCAGCGCCTGGCAGCAGTGGCGTCTGGCGGAAAACCTCAGTGTGACGCTCCCCGCGGTCCCACGCCATCCCGCAT
739▶ rAlaTrpSerGluAlaGlyHisI leSerAlaTrpGlnGlnTrpArgLeuAlaGluAsnLeuSerValThrLeuProAlaAlaSerHisAlaI leProHis
3701 CTGACCACCAGCGAAATGGATTTTTGCATCGAGCTGGGTAATAAGCGTTGGCAATTTAACCGCCAGTCAGGCTTTCTTTCACAGATGTGGATTGGCGATA
773▶ LeuThrThrSerGluMetAspPheCysI leGluLeuGlyAsnLysArgTrpGlnPheAsnArgGlnSerGlyPheLeuSerGlnMetTrpI leGlyAspL
3801 AAAAACAACTGCTGACGCCGTGCGCGATCAGTTACCCCGTGCACCGCTGGATAACGACATTGGCGTAAGTGAAGCGACCCGATTGACCCTAACGCCTG
806▶ ysLysGlnLeuLeuThrProLeuArgAspGlnPheThrArgAlaProLeuAspAsnAspI leGlyValSerGluAlaThrArgI leAspProAsnAlaTr
3901 GGTGGAACGCTGGAAGGCGGGGCCATTACCAGGCCGAAGCAGCGTTGTTGCAGTGCACGGCAGATACACTTGCTGATGCGGTGCTGATTACGACCGCT
839▶ pValGluArgTrpLysAlaAlaGlyHisTyrGlnAlaGluAlaAlaLeuLeuGlnCysThrAlaAspThrLeuAlaAspAlaValLeuI leThrThrAla
4001 CACGCGTGGCAGCATCAGGGGAAAACCTTATTTATCAGCCGGAAAACCTACCGGATTGATGGTAGTGGTCAAATGGCGATTACCGTTGATGTTGAAGTGG
873▶ HisAlaTrpGlnHisGlnGlyLysThrLeuPheI leSerArgLysThrTyrArgI leAspGlySerGlyGlnMetAlaI leThrValAspValGluValA
4101 CGAGCGATACCCGCATCCGGCGCGGATTGGCCTGAAGTCCAGCTGGCGCAGGTAGCAGAGCGGGTAAACTGGCTCGGATTAGGGCCGCAAGAAAACCTA
906▶ laSerAspThrProHisProAlaArgI leGlyLeuAsnCysGlnLeuAlaGlnValAlaGluArgValAsnTrpLeuGlyLeuGlyProGlnGluAsnTy
4201 TCCGACCGCCTTACTGCCGCTGTTTTGACCGCTGGGATCTGCCATTGTGCAGACATGTATACCCCGTACGCTTCCCGAGCGAAAACGGTCTGCGCTGC
939▶ rProAspArgLeuThrAlaAlaCysPheAspArgTrpAspLeuProLeuSerAspMetTyrThrProTyrValPheProSerGluAsnGlyLeuArgCys
4301 GGGACGCGCAATTGAATTATGGCCACACCAGTGGCGCGGCGACTTCCAGTTCAACATCAGCCGCTACAGTCAACAGCAACTGATGAAACCAGCCATC
973▶ GlyThrArgGluLeuAsnTyrGlyProHisGlnTrpArgGlyAspPheGlnPheAsnI leSerArgTyrSerGlnGlnGlnLeuMetGluThrSerHisA
4401 GCCATCTGCTGCACGCGGAAGAAGGCACATGGCTGAATATCGACGGTTTCCATATGGGGATTGGTGGCGCAGACTCCTGGAGCCCGTCAGTATCGGGGA
1006▶ rgHisLeuLeuHisAlaGluGluGlyThrTrpLeuAsnI leAspGlyPheHisMetGlyI leGlyGlyAspAspSerTrpSerProSerValSerAlaGI

EcoRI (4569)

4501 ATTACAGCTGAGCGCCGCTGCTACCATTACCAGTTGGTCTGGTGTCAAAAATAATAATCTAGTCGAGAATTCGCTAGCTCGACATGATAAGATACATTG
1039▶ uLeuGlnLeuSerAlaGlyArgTyrHisTyrGlnLeuValTrpCysGlnLys•••
4601 ATGAGTTTGGACAACCACAACCTAGAATGCAGTGAATAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTGAAATTTGTGATGCTATT
4701 GCTTTATTTGTAACCATTATAAGCTGCAATAAACAAGTTAACAACAACAATTGCATTCATTTATGTTTCAGGTTACAGGGGAGGTGTGGGAGGTTTTTT

PacI (4850)

SwaI (4840)

4801 AAAGCAAGTAAACCTCTACAAATGTGGTAGATCCATTTAAATGTTAATTAAGTCCATGACCAAAATCCCTTAACGTGAGTTTTCGTTCCACTGAGCG
4901 TCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTCTGCGGTAATCTGCTGCTTGCAAACAAAAAACCCGCTACCAGCGGTGG
5001 TTTGTTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAAGTGGCTTACGAGAGCGCAGATACCAATACTGTTCTTCTAGTGTAGCCGTAGTT
5101 AGGCCACCACTTCAAGAACTCTGTAGCACCGCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTGTCTTACC
5201 GGGTTGGACTCAAGACGATAGTTACCGGATAAAGGCGCAGCGTCTGGGCTGAACGGGGGTTCTGTGCACACAGCCAGCTTGAGCGGAACGACCTACACCG
5301 AACTGAGATACCTACAGCGTGTAGCTATGAGAAGGCGCCAGCTTCCGAAGGGAGAAAGCGGCACAGGTATCCGGTAAGCGGCAGGGTCCGGAACAGGAGA
5401 CGGCACGAGGGAGCTTCCAGGGGAAAACGCTGGTATCTTTATAGTCTGTGCGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCA

PacI (5590)

5501 GGGGGGGGAGCCTATGGAAAACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGTGCGCCTTTTGTCTACATGTTCTTAATTAATTTTTCA
5601 AAAGTAGTTGACAATTAATCATCGGCATAGTATATCGGCATAGTATAATACGACTACTATAGGAGGGCCATCATGGCCAAGTTGACCAGTGTGTCCCA
5701 GTGCTCACAGCCAGGGATGTGGCTGGAGCTTTGAGTTCTGGACTGACAGGTTGGGTTCTCCAGAGATTTGTGGAGGATGACTTTGCAGGTGTGGTCA
5801 GAGATGATGTACCCTGTTTCTCAGCAGTCCAGGACCAGGTGGCTGACAACACCCTGGCTTGGGTGTGGGTGAGAGGACTGGATGAGCTGTATGC
5901 TGAGTGGAGTGTGGTGTCTCCACCAACTCAGGATGCCAGTGGCCCTGCCATGACAGAGATTGGAGAGCAGCCCTGGGGGAGAGACTTTGCCCTGAGA

PacI (6099)

6001 GACCCAGCAGGCAACTGTGTGCACTTTGTGGCAGAGGAGCAGGACTGAGGATAAGAATTGTAACAAAAACCCCGCCCGGGGTTTTTTGTAAATTA
6101 A