



SdaI (7) SpeI (14) SacI (30)

1 CCTGCAGGGCCACTAGTAGCTCTGAGCTCCTCTGCTCGCCCAATCCTTCCAACCCCTATGGTGGTATGGCTGACACAGAAAATGCTGCTCTGT

StuI (145)

101 ATGGGACATTTGCCCTCTTCTCAAATATAAGACAGGATGAGGCCTAGCTTTTGTGCTCCAAAGTTTAAAGAACACATTGCACGGCATTAGGGAC

201 TCTAAAGGGTGGAGGAGGAATGAGGAATTGCATCATGCAAGGCTGGTCTCATCCATCACTGCTTCCAGGGCCAGAGTGGCTTCCAGGAaGTATTCT

301 TACAAAGGAAGCCCGATCTGTAGTAACTCAGAGCCATTTTCTGCGTTAACCCCTCCCGACCTCATATACAGGAGTAACATGATCAGTGACCTGGG

MscI (409)

401 GGAGCTGGCCAAACTGCGGGACCTGCCAAGCTGAGGGCCTTGGTGTGCTGGACAACCCTGTGCCGATGAGACTGACTACCGCCAGGAGGCCCTGGTG

ScaI (535)

501 CAGATGGCACACCTAGAGCGCCTAGACAAAGTACTATGAGGACGAGGACCGGGCAGAAGCTGAGGAGATCCGACAGAGGCTGAAGGAGGAACAGGAGC

SdaI (669)

601 AAGAACTCGACCCGGACCAAGACATGGAACCGTACCTCCCGCAACTTAGTGGCTCTTAGCCTGCAGGGACAGTAAAGGTGATGGCAGGAAGGCAGCC

701 CCCGGAGGtCAAAGGCTGGGCACGCGGGAGGAGGCCAGAGTCAAGGCTGCGGGTATCTCAGATATGAAGGAAAGATGAGAGAGGCTCAGGAAGAGGT

PshAI (855)

801 AAGAAAAGACACAAGAGACCAGAGAAGGGAGAAGAATTAGAGAGGGAGGCAGAGGACCGCTGTCTACAGACATAGCTGGTAGAGACTGGGAGGAAGGG

901 ATGAACCCTGAGCGCATGAAGGGAAGGAGGTGGCTGGTGTATATGGAGGATGATGCTGGCCAGGGAAAAGATCCTGCACTaaaaATCTGAAGCTaaa

StuI (1062)

1000 aat AACAGGACACGGGGTGGAGAGGCGAAAGGAGGGCAGAGTGAgGCAGAGAGACTGAGagGCCTGGGGATGTGGGCATTCCGGTAGGGCACACAGTTC

AatII (1140)

1099 ACTTGTCTTCTTTTTCCAGGAGGCCAAAGATGCTGACGTCAAGAACTCATAATACCCAGTGGGGACCACCGCATTTCATAGCCCTGTTACAAGAAGTG

1199 GGAGATGTTCTTTTTGTCCAGACTGGAATCCgTTACATCCCGAGGCTCAGTTCTGTGGTGGTCATCTCTGTGTGGCTTGTCTGTGGCCTACCTA

1299 AAGTCTAAGCACAGCTCTCAAGCAGATCCGAGGCGACTAAGATGCTAGTAGGGTGTCTGGAGAGAAGAGCCGAGGAGGTGGCTGTGATGGATCAGT

1399 TCAGCTTCAAATAAAAAGCGTTTTTATATTCTGTGTGAGTTCGTGAACCCTGTGGTGGCTTCTCCATCTGTCTGGGTTAGTACCTGCCACTATAC

SmaI (1594) XhoI (1524) SrfI (1594)

1499 TGAATAAGGgGACGCCTGCTTCCCTCGAGTTGGCTGGACAAGGTTATGAGCATCCGTGTACTTATGGGGTTGCCAGCTTGGTCTGGATCGCCCGGGCC

BsiWI (1638) SmaI (1683)

1599 CTTCCCCACCCGTTGGTTCCACCACCACCCGCGCTCGTACGTGCGTCTCCGCTGCAGCTTTGACTCATCGGGGCCCGGGTACATGCGCTCG

KasI (1712) HindIII (1785)

1699 CTCGGCTCTATAGCGCCGCCCTGCCACCCCGCCGCGTGGGAGCCGAGCCGCCCACTCTGCTCTCTGCGCCGAAGCTTCGAGGGCT

EcoNI (1831)

1799 CGCATCTCTCCTACCGCGCCCGCCCTACCTGAGGCGCCATCCACGCCGTTGAGTCGCGTTCTGCCGCTCCCGCTGTGGTGCCTCCTGAAGT

NaeI (1983)

1899 CGTCCGCGCTAGGTAAGTTAAAGCTCAGGTGAGACCGGGCCTTTGTCCGGCGCTCCCTGGAGCCTACCTAGACTAGCCGGCTCTCCACGCTTTG

NcoI (2070)

1999 CTGACCCTGCTTCAACTCTACGTCTTTGTTTCTGTTCTGCGCGTTACAGATCCAAGCCACCATGGGGGTTTCATCATCATCATCATC

NheI (2108) Acc65I (2164)

2099 ATGGTATGGCTAGCATGACTGGTGGACAGCAAATGGGTCGGGATCTGTACGACGATGACGATAAGGTACCTAAGGATCAGCTTGGAGTTGATCCCGTCGT

10 isGlyMetAlaSerMetThrGlyGlyGlnGlnMetGlyArgAspLeuTyrAspAspAspLysValProLysAspGlnLeuGlyValAspProValVa

2199 TTTACAACGTCGTGACTGGGAAAACCTGGCGTTACCAACTTAATCGCCTGACGACATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCCGC

43 lLeuGlnArgArgAspTrpGluAsnProGlyValThrGlnLeuAsnArgLeuAlaAlaHisProProPheAlaSerTrpArgAsnSerGluGluAlaArg

FspI (2324)

2299 ACCGATCGCCCTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGCTTGGCTGGTTCCGGCACCAGAAGCGGTGCCGAAAGCTGGCTGGAGTGGC

77 ThrAspArgProSerGlnGlnLeuArgSerLeuAsnGlyGluTrpArgPheAlaTrpPheProAlaProGluAlaValProGluSerTrpLeuGluCysA

2399 ATCTTCTGAGGCCGATACTGCTGCTGCCCTCAAACCTGGCAGATGACGGTTACGATGCGCCATCTACCCAAGTAACCTATCCCATACGGTCAA

110 spLeuProGluAlaAspThrValValValProSerAsnTrpGlnMetHisGlyTyrAspAlaProl leTyrThrAsnValThrTyrProI leThrValAs

2499 TCCGCCGTTTGTCCACGGAGAAATCCGACGGTGTACTGCTCACATTTAATGTTGATGAAAGCTGGCTACAGGAAGGCAGACGCGAATTATTTTT

143 nProProPheValProThrGluAsnProThrGlyCysTyrSerLeuThrPheAsnValAspGluSerTrpLeuGlnGluGlyGlnThrArgI leI lePhe

2599 GATGGCGTTAACTCGCGTTCATCTGTGGTGAACGGGCGCTGGTTCGGTACGGCCAGGACAGTCTGGTTCGGCTGAATTTGACCTGAGCGCATTTT

177 AspGlyValAsnSerAlaPheHisLeuTrpCysAsnGlyArgTrpValGlyTyrGlyGlnAspSerArgLeuProSerGluPheAsnSerAlaPheL

2699 TACGCGCCGGAGAAAACCGCTCGCGGTGATGGTGTGCTGCGTTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGATGAGCGGCATTTCCG

210 euArgAlaGlyGluAsnArgLeuAlaValMetValLeuArgTrpSerAspGlySerTyrLeuGluAspGlnAspMetTrpArgMetSerGlyI lePheAr

AatII (2805)

2799 TGACGTCTGTTGCTGCATAAACCGACTACCAAATCAGCGATTTCCATGTTGCCACTCGCTTAAATGATGATTTACGCGCGCTGTACTGGAGGCTGAA

243 gAspValSerLeuLeuHisLysProThrThrGlnI leSerAspPheHisValAlaThrArgPheAsnAspAspPheSerArgAlaValLeuGluAlaGlu

2899 GTTCAGATGTGCGGCGAGTTGCGTGACTACCTACGGGTAACAGTTTCTTTATGGCAGGGTGAACCGCAGGTCGCCAGCGGCACCGGCCTTTCCGGGGTG
277 ValGlnMetCysGlyGluLeuArgAspTyrLeuArgValThrValSerLeuTrpGlnGlyGluThrGlnValAlaSerGlyThrAlaProPheGlyGlyG
ClaI (3006)
2999 AAATTATCGATGAGCGTGGTGGTTATGCCGATCGCGTCACACTACGCTGAACGTCGAAAACCCGAAACTGTGGAGCGCCGAAATCCCGAATCTCTATCG
310 IuI IeI leAspGluArgGlyGlyTyrAlaAspArgValThrLeuArgLeuAsnValGluAsnProLysLeuTrpSerAlaGluI leProAsnLeuTyrAr
3099 TCGCGTGGTTGAATGACACCAGCGGCGCAGCTGATTGAAGCAGAAAGCCTGCAGTGTCCGGTTTCCGCGAGGTGCGGATTGAAAATGGCTGCTGCTG
343 gAlaValValGluLeuHisThrAlaAspGlyThrLeuI leGluAlaGluAlaCysAspValGlyPheArgGluValArgI leGluAsnGlyLeuLeuLeu
EcoRV (3295)
3199 CTGAACGGCAAGCCGTTGCTGATTCGAGGCGTTAACCGTCACGAGCATCATCTCTGCATGGTCAGGTCATGGATGAGCAGACGATGGTGCAGGATATCC
377 LeuAsnGlyLysProLeuLeuI leArgGlyValAsnArgHisGluHisHisProLeuHisGlyGlnValMetAspGluGlnThrMetValGlnAspI leL
3299 TGCTGATGAAGCAGAACAACCTTAACGCCGTGCGCTGTTTCGATTATCCGAACCATCCGCTGTGGTACACGCTGTGCACCGCTACGGCCTGTATGGT
410 euLeuMetLysGlnAsnAsnPheAsnAlaValArgCysSerHisTyrProAsnHisProLeuTrpTyrThrLeuCysAspArgTyrGlyLeuTyrValVa
SspI (3412)
3399 GGATGAAGCCAATATTGAAACCCAGCGCATGGTGCCAATGAATCGTCTGACCAGTATCCGCGCTGGCTACCGGCGATGAGCGAACGCGTAACCGGAATG
443 IAspGluAlaAsnI leGluThrHisGlyMetValProMetAsnArgLeuThrAspAspProArgTrpLeuProAlaMetSerGluArgValThrArgMet
BsaBI (3508)
3499 GTGCAGCGCGATCGTAATCACCCGAGTGTGATCATCTGGTCGCTGGGAATGAATCAGGCCACGGCGTAATCACGACGCGTGTATCGCTGGATCAAT
477 ValGlnArgAspArgAsnHisProSerValI leI leTrpSerLeuGlyAsnGluSerGlyHisGlyAlaAsnHisAspAlaLeuTyrArgTrpI leLysS
BssHIII (3680)
3599 CTGTCGATCCTTCCCGCCCGTGCAGTATGAAGGCGGCGGAGCCGACACCACGGCCACCGATATTATTTGCCGATGTACGCGCGCTGGATGAAGACCA
510 erValAspProSerArgProValGlnTyrGluGlyGlyAlaAspThrThrAlaThrAspI leI leCysProMetTyrAlaArgValAspGluAspGl
3699 GCCCTTCCCGGCTGTGCCGAAATGGTCCATCAAAAAATGGCTTTCGCTACCTGGAGAGACGCCCGCTGATCTTTGCGAATACGCCACCGATGGGT
543 nProPheProAlaValProLysTrpSerI leLysLysTrpLeuSerLeuProGlyGluThrArgProLeuI leLeuCysGluTyrAlaHisAlaMetGly
3799 AACAGCTTGGCGGTTTCGTAATAACTGGCAGGCGTTTCGTCAGTATCCCGTTTACAGGGCGGCTTCGCTGGGACTGGTGGATCAGCTGCTGATTA
577 AsnSerLeuGlyGlyPheAlaLysTyrTrpGlnAlaPheArgGlnTyrProArgLeuGlnGlyGlyPheValTrpAspTrpValAspGlnSerLeuI leL
3899 AATATGATGAAAACGGCAACCCGTTGGTCGGCTTACGGCGGTGATTTTGGCGATACGCCGAACGATCGCCAGTTCTGTATGAACGGTCTGGCTTTGCCGA
610 ysTyrAspGluAsnGlyAsnProTrpSerAlaTyrGlyGlyAspPheGlyAspThrProAsnAspArgGlnPheCysMetAsnGlyLeuValPheAlaAs
Eco47III (4017)
3999 CCGCAGCGCGATCCAGCGCTGACGGAAGCAAAAACACCAGCAGCAGTTTTTCCAGTTCGTTTATCCGGGCAAACCATCGAAGTGACCAGCGAATACCTG
643 pArgThrProHisProAlaLeuThrGluAlaLysHisGlnGlnGlnPhePheGlnPheArgLeuSerGlyGlnThrI leGluValThrSerGluTyrLeu
SacI (4122)
4099 TTCCGTCATAGCGATAACGAGCTCCTGCACTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCCTCTGGATGTCGCTCCACAAGGTA
677 PheArgHisSerAspAsnGluLeuHisTrpMetValAlaLeuAspGlyLysProLeuAlaSerGlyGluValProLeuAspValAlaProGlnGlyL
4199 AACAGTTGATTGAACCTGCTGAACACTCCGACCGGAGCGCCGGCAACTCTGGCTCACAGTACGCGTAGTGCAACCGAAGCGCAGCCGATGGTACAGA
710 ysGlnLeuI leGluLeuProGluLeuProGlnProGluSerAlaGlyGlnLeuTrpLeuThrValArgValValGlnProAsnAlaThrAlaTrpSerGl
4299 AGCCGGGCACATCAGCGCTGGCAGCAGTGGCGTCTGGCGAAAACCTCAGTGTGAGCTCCCGCGCGTCCACGCCATCCCGCATCTGACCACACAGC
743 uAlaGlyHisI leSerAlaTrpGlnGlnTrpArgLeuAlaGluAsnLeuSerValThrLeuProAlaAlaSerHisAlaI leProHisLeuThrThrSer
4399 GAAATGGATTTTTCATCGAGCTGGTAATAAGCGTTGGCAATTTAACCGCCAGTCAGGCTTTCTTTACAGATGTGGATGGCGATAAAAAACAACCTGC
777 GluMetAspPheCysI leGluLeuGlyAsnLysArgTrpGlnPheAsnArgGlnSerGlyPheLeuMetTrpI leGlyGlyLysLysGlnLeuL
4499 TGACGCCGCTGCGCGATCAGTTACCCGTCACCGCTGGATAACGACATTGGCGTAAGTGAAGCGACCCGATTGACCTAACCGCTGGGTGCAAGCGCTG
810 euThrProLeuArgAspGlnPheThrArgAlaProLeuAspAsnAspI leGlyValSerGluAlaThrArgI leAspProAsnAlaTrpValGluArgTr
4599 GAAGCGCGGGCCATTACCAGGCCGAAGCAGCGTTGTTGCAGTGCACGGCAGATACACTTGCTGATGCGGTGCTGATTACGACCGCTACCGCTGGCAG
843 pLysAlaAlaGlyHisTyrGlnAlaGluAlaLeuLeuGlnCysThrAlaAspThrAlaLeuAlaValLeuI leThrThrAlaHisAlaTrpGln
4699 CATCAGGGGAAAACCTTATTTACGCGGAAAACCTACCGGATTGATGGTGGTCAAATGCGGATTACCGTTGATGTTGAAGTGGCGAGCGATACAC
877 HisGlnGlyLysThrLeuPheI leSerArgLysThrTyrArgI leAspGlySerGlyGlnMetAlaI leThrValAspValGluValAlaSerAspThrP
4799 CGCATCCGGCGGGATTGGCCTGAACTGCCAGCTGGCGCAGGTAGCAGAGCGGGTAAACTGGCTCGGATTAGGGCCGCAAGAAAATATCCCGACCGCT
910 roHisProAlaArgI leGlyLeuAsnCysGlnLeuAlaGlnValAlaGluArgValAsnTrpLeuGlyLeuGlyProGlnGluAsnTyrProAspArgLe
Bst1107I (4944)
BspLU11I (4941) BsiWI (4952)
4899 TACTGCCGCTGTTTTGACCGCTGGGATCTGCCATTGTCAGACATGTATACCCGCTAGCTCTTCCGAGCGAAAACGGTCTGCGCTGCGGGACGCGCGAA
943 uThrAlaAlaCysPheAspArgTrpAspLeuProLeuSerAspMetTyrThrProTyrValPheProSerGluAsnGlyLeuArgCysGlyThrArgGlu
4999 TTGAATTATGGCCACACCACTGGCGCGGCGACTTCCAGTTCAACATCAGCCGCTACAGTCAACAGCAACTGATGAAAACGAGCCATCGCCATCTGCTGC
977 LeuAsnTyrGlyProHisGlnTrpArgGlyAspPheGlnPheAsnI leSerArgTyrSerGlnGlnGlnLeuMetGluThrSerHisArgHisLeuLeuH
NdeI (5139)
5099 ACGCGGAAGAAGGCACATGGCTGAATATCGACGGTTTCCATATGGGGATTGGTGGCGACGACTCCTGGAGCCGTCAGTATCGCGGAATTACAGCTGAG
1010 isAlaGluGluGlyThrTrpLeuAsnI leAspGlyPheHisMetGlyI leGlyGlyAspAspSerTrpSerProSerValSerAlaGluLeuGlnLeuSe
NheI (5261)
EcoRI (5255)
5199 CGCCGGTCTGCTACCATTACCAGTTGGTCTGGTGTCAAAAATAATAAATCTAGTCGAGAATTCGTAGCTGCAGATGATAAGATACATTGATGAGTTTGGAC
1043 rAlaGlyArgTyrHisTyrGlnLeuValTrpCysGlnLys •••
5299 AAACCACAACCTAGAATGCACTGAAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTA
MfeI (5435)
5399 ACCATTATAAGCTGCAATAAAACAAGTTAAACAACAACATTCATTCTTTATGTTTCAGGTTACAGGGGAGGTGTGGGAGGTTTTTAAAGCAAGTAAA
SwaI (5526)
5499 ACCTCTACAAATGTGGTAGATCCATTTAAATGTTAATTAAGTAGCCATGACCAAAATCCCTTAACGTGAGTTTTCTGTTCCACTGAGCGTCAGACCCCGTA
5599 GAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAACCCCGCTACCAGCGGTGTTTTGTTGCCGG
5699 ATCAAGAGCTACCAACTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCGCAGATACCAAATACTGTTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTT
5799 CAAGAACTCTGTAGACCCGCTACATACTCGCTCTGCTAATCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCTGTCTTACCGGGTTGGACTCA
5899 AGACGATAGTTACCGGATAAGGCGCAGCGGTGCGGCTGAACGGGGGTTCTGTGCACACAGCCAGCTTGAGCGAACGACCTACACCGAACTGAGATACC

5999 TACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGCGGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGA

6099 GCTTCCAGGGGAAACGCCTGGTATCTTTATAGTCTGTGCGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGCGGAGC

6199 CTATGGAAAAACGCCAGCAACGCGCCTTTTTACGGTTCCTGCCTTTTCTGGCCTTTTGTCTCACATGTTCTTAATTAATTTTTCAAAGTAGTTGAC

BspLU11I (6264)

MscI (6364)

AseI (6302) **SfiI (6353)**

6299 AATTAATCATCGGCATAGTATATCGGCATAGTATAATACGACTCACTATAGGAGGGCCATCATGGCCAAGTTGACCAGTGCTGCCAGTGCTCACAGCC

6399 AGGGATGTGGCTGGAGCTGTTGAGTTCTGGACTGACAGGTTGGGGTCTCCAGAGATTTTGTGGAGGATGACTTTGCAGGTGTGGTCAGAGATGATGTCA

6499 CCCTGTTTCATCTCAGCAGTCCAGGACCAGGTGGTGCCTGACAACACCCTGGCTTGGGTGTGGTGAGAGGACTGGATGAGCTGTATGCTGAGTGGAGTGA

6599 GGTGGTCTCCACCACTTCAGGGATGCCAGTGGCCCTGCCATGACAGAGATTGGAGAGCAGCCTGGGGGAGAGAGTTTGCCTGAGAGACCCAGCAGGC

6699 AACTGTGTGCACTTTGTGGCAGAGGAGCAGGACTGAGGATAAGAATTGTAACAAAAACCCCGCCCGCGGGGTTTTTTGTTAATTAA

114 AsnCysValHisPheValAlaGluGluGlnAsp•••

14 ArgAspValAlaGlyAlaValGluPheTrpThrAspArgLeuGlyPheSerArgAspPheValGluAspAspPheAlaGlyValValArgAspAspValT

47 hrLeuPheI leSerAlaValGlnAspGlnValValProAspAsnThrLeuAlaTrpValTrpValArgGlyLeuAspGluLeuTyrAlaGluTrpSerGl

80 uValValSerThrAsnPheArgAspAlaSerGlyProAlaMetThrGluI leGlyGluGlnProTrpGlyArgGluPheAlaLeuArgAspProAlaGly