



PvuI (7)
SgfI (6)
EcoNI (96)

1 GGATCTGGATCGCTCCGGTGCCCGTCAGTGGGAGAGCGCACATCGCCACAGTCCCGGAGAAGTTGGGGGAGGGGTCGGCAATTGAACGGGTGCCTA
 101 GAGAAGGTGGCGGGGTAAGTGGAAAGTGATGTCGTGACTGGTCCGCCTTTTCCGAGGGTGGGGGAGAACCCTATATAAGTGCAGTAGTCGCC

HindIII (245)
EcoNI (287)

201 GTGAACGTTCTTTTTCGCAACGGGTTTGCCGCCAGAACACAGCTGAAGCTTCGAGGGCTCGCATCTCTCTTTCACGCGCCCGCCCTACCTGAGGCC
 301 GCCATCCACGCCGTTGAGTCGCGTTTCTGCCGCCTCCCGCCTGTGGTGCCTCCTGAAGTGCCTCCGCCGTCTAGGTAAGTTTAAAGCTCAGGTCGAGACC

NgoMI (441)
NaeI (441)

401 GGGCCTTTGTCCGGCGCTCCCTTGAGCCTACCTAGACTCAGCCGGCTCTCCACGCTTTGCTGACCCTGCTTGTCTCAACTCTACGCTTTGTTTCGTTT

KasI (535)
AgeI (552)
BspHI (560)

501 TCTGTTCTGGCCGTTACAGATCCAAGCTGTGACCGCGCCTACCTGAGATCACCGGTCATCATGAGCGCCCTCCGGTCTCGCGCCGCCAGTCCGCT
1▶ M S A P P V L R P P S P L

Bsp120I (661)
XmaI (658)
SrfI (657)
Bsp120I (655)

601 GCTGCCCGTGGCGGGCGCAGCTGCCGAGCGGCCCGCCGACTGGTCCCAGGGTCCGGCCCGGGCCCGCGCTTCTGGCTCCTGTCGCGGCCCGCCGGTCC
 13▶ L P V A A A A A A A A A A L V P G S G P G P A P F L A P V A A P V
 701 GGGGCATCTCGTTCATCTGCAGATCGGCCTGAGCCGTGAGCCGGTGTCTGCTGCTGAGGACTCGTCCGGGACTACAGCCTGGCGCAGTCCGCGAGA
 47▶ G G I S F H L Q I G L S R E P V L L L Q D S S G D Y S L A H V R E

SalI (814)

801 TGGCTTGCTCCATTGTCGACCAGAAGTTCCTGAATGTGGTTTCTACGGAATGTATGATAAGATCCTGCTTTTTCGCCATGACCCCTACCTCTGAAAACAT
 80▶ M A C S I V D Q K F P E C G F Y G M Y D K I L L F R H D P T S E N I

EcoRV (925)

901 CCTCAGCTGGTAAAGCGCCAGTGATATCCAGAAAGCGATCTTATTGAAGTGGTCTGTGACGTTCCGCCACCTTTGAAGACTTTTCAAGTTCGTCCTCC
 113▶ L Q L V K A A S D I Q E G D L I E V V L S A S A T F E D F Q I R P
 1001 CAGCTCTCTTTGTTTCATCAGAGCTCCAGCTTTCTGTGATCACTGTGGAGAAATGCTGTGGGGCTGGTACGTCAGGCTTAAATGTGAAGGGT
 147▶ H A L F V H S Y R A P A F C D H C G E M L W G L V R Q G L K C E G
 1101 GTGGTCTGAATTACCATAAGAGATGTGCATTTAAATACCCAACAATTGCAGCGGTGTGAGGCGGAGAAGGCTCTCAAACGTTTCCCTACTGGGTCAG
 180▶ C G L N Y H K R C A F K I P N N C S G V R R R R L S N V S L T G V S
 1201 CACCATCCGCACATCATCTGCTGAAGTCTCTACAAGTCCGCTGATGAGCCCTTCTGCAAAAATCACCATCAGAGTCGTTTATTGGTCGAGAGAAGAGG
 213▶ T I R T S S A E L S T S A P D E P L L Q K S P S E S F I G R E K R
 1301 TCAAATTCATCATAACATTGGACACCAATTCACCTTGACAAGATTTTGTGCTAAAGTTAAAGTGCCGCACACATTTGTCATCCACTCCTACACCC
 247▶ S N S Q S Y I G R P I H L D K I L M S K V K V P H T F V I H S Y T

DraIII (1404)
Scal (1415)
HindIII (1426)
ApaLI (1496)

1401 GGCCACAGTGTGCCAGTACTGCAAGAAGCTTCTGAAGGGCTTTTCAGGCAGGGCTTGCAGTGCAAAGATTGCAGATTCAACTGCCATAAACGTTGTGC
 280▶ R P T V C Q Y C K K L L K G L F R Q G L Q C K D C R F N C H K R C A

VspI (1537)
AseI (1537)

1501 ACCGAAAGTACCAAACTGCCTTGGCGAAGTACCATTAAATGGAGATTTGCTTAGCCCTGGGCAGAGTCTGATGTGGTCATGGAAGAAGGGAGTGAT
 313▶ P K V P N N C L G E V T I N G D L L S P G A E S D V V M E E G S D

XcmI (1686)

1601 GACAATGATAGTAAAGGAACAGTGGGCTCATGGATGATGGAAGAAGCAATGGTCCAAGATGCAGAGATGGCAATGCCAGAGTGCCAGAACGACAGTG
 347▶ D N D S E R N S G L M D D M E E A M V Q D A E M A M A E C Q N D S

BspHI (1778)

1701 GCGAGATGCAAGATCCAGACCCAGACCAGGACGCCAACAGAACCATCAGTCCATCAACAAGCAACATATCCCACCTATGAGGGTAGTGCAGTCTGT
 380▶ G E M Q D P D P D H E D A N R T I S P S T S N N I P L M R V V Q S V

BspHI (1829)

1801 CAAACACACGAAGAGGAAAAGCAGCAGTCAAGAAAGGATGGATGGTCCACTACACAGCAAGGACAGCTGCGGAAACGGCACTATTGGAGATTG
 413▶ K H T K R K S S T V M K E G W M V H Y T S K D T L R K R H Y W R L
 1901 GATAGCAAATGATTACCCTCTTTCAGAAATGACACAGGAAGCAGGTAACAAGGAAATTCCTTTATCTGAAATTTTGTCTGGAACCAAGTAAAACTT
 447▶ D S K C I T L F Q N D T G S R Y Y K E I P L S E I L S L E P V K T

BstBI (2035)
AsuII (2035)

2001 CAGCTTTAATCCATGAGGGCCAACTCATTGTTTTCGAAATCACTACGCAAAATGTAGTGTATTATGTGGGAGAAAATGTGGTCAATCCTTCCAGCCC
 480▶ S A L I P N G A N P H C F E I T T A N V V Y Y V G E N V V N P S S P

MscI (2144)
BsiBI (2160)
SphI (2172)

2101 ATCACAAATAACAGTGTCTCACCAGTGGCGTTGGTGCAGATGTGGCCAGGATGTGGGAGATAGCCATCCAGCATGCCCTTATGCCCGTCATTCCCAAG
 513▶ S P N N S V L T S G V G A D V A R M W E I A I Q H A L M P V I P K

EcoRV (2236)

2201 GGCTCCTCCGTGGGTACAGGAACCAACTGCACAGAGATATCTCTGTGAGTATTTTCAGTATCAAATGCCAGATTCAAGAAAATGTGGACATCAGCACAG
 547▶ G S S V G T G T N L H R D I S V S I S V S N C Q I Q E N V D I S T

Scal (2322)

2301 TATATCAGATTTTCTGATGAAGTACTGGTTCTGGACAGTTTGAATGTTTATGGAGAAAACATCGTAAAAACAGGAAGAGATGTAGCTATTAATAAAT
 580▶ V Y Q I F P D E V L G S G Q F G I V Y G G K H R K T G R D V A I K I
 2401 CATTGACAAATTACGATTTCCAACAAAACAAGAAAGCCAGCTTCGTAATGAGGTTGCAATTCTACAGAACCTTCATCACCTGGTGTGTAATTTGGAG
 613▶ I D K L R F P T K Q E S Q L R N E V A I L Q N L H H P G V V N L E

NcoI (2547)

2501 TGTATGTTTGGAGACGCCTGAAAGAGTGTGGTTGTTATGGAAAACTCCATGGAGACATGCTGGAAATGATCTTGTCAAGTGAAAAGGCGAGTTGCCAG
647▶ C M F E T P E R V F V V M E K L H G D M L E M I L S S E K G R L P

2601 AGCACATAACGAAGTTTTTAATTACTCAGATACTCGTGGCTTTGCGGCACCTTCATTTAAAAATATCGTTCACTGTGACCTCAAACCGAAAAATGTGTT
680▶ E H I T K F L I T Q I L V A L R H L H F K N I V H C D L K P E N V L

BspEI (2777) Asp718I (2794)

2701 GCTAGCCTCAGCTGATCCTTTCTCAGGTGAACTTTGTGATTTTGGTTTTGCCCGGATCATCGGAGAGAAGTCTTTCCGGAGGTGAGTGGTGGGTACC
713▶ L A S A D P F P Q V K L C D F G F A R I I G E K S F R R S V V G T

BspLU11I (2855)

EcoO109I (2819) XbaI (2850)

2801 CCCGCTTACCTGGCTCCTGAGGTCTAAGGAACAAGGGCTACAATCGCTCTAGACATGTGGTCTGTTGGGGTCATCATCTATGTAAGCCTAAGCGGCA
747▶ P A Y L A P E V L R N K G Y N R S L D M W S V G V I I Y V S L S G

BstXI (2965)

XcmI (2962) BspHI (2988)

2901 CATTCCCATTTAATGAAGATGAAGACATACACGACCAAATTCAGAATGCAGCTTTTCATGTATCCACCAAATCCCTGGAAGGAAATATCTCATGAAGCCAT
780▶ T F P F N E D E D I H D Q I Q N A A F M Y P P N P W K E I S H E A I

Eco47III (3038) SexAI (3091)

3001 TGATCTTATCAACAATTTGCTGCAAGTAAAAAGAGAAAGCGTACAGTGTGGATAAGACCTTGAGCCACCCTGGCTACAGGACTATCAGACCTGGTTA
813▶ D L I N N L L Q V K M R K R Y S V D K T L S H P W L Q D Y Q T W L

Eco47III (3131)

3101 GATTTGCGAGAGCTGGAATGCAAAAATCGGGGAGCGCTACATCACCCATGAAAGTGATGACCTGAGGTGGGAGAAGTATGCAGGCGAGCAGGGGCTGCAGT
847▶ D L R E L E C K I G E R Y I T H E S D D L R W E K Y A G E Q G L Q

3201 ACCCCACACACCTGATCAATCCAAGTGTAGCCACAGTACACTCCTGAGACTGAAGAAACAGAAATGAAAGCCCTCGGTGAGCGTGCAGCATCCTCTG
880▶ Y P T H L I N P S A S H S D T P E T E E T E M K A L G E R V S I L •

EcoRI (3308)

3301 AGTTCATGAATTCGCTAGCTCGACATGATAAGATACATTGATGAGTTTGGACAAACCACAACACTAGAATGCAGTGAAAAAATGCTTTATTTGTGAAATT
913▶

HpaI (3477)

3401 TGTGATGCTATTGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAAACAAGTTAAACAACAACATTGCATTCA

EcoRI (3573)

3501 TTTTATGTTTCAGGTTCCAGGGGAGGTGTGGGAGGTTTTTAAAGCAAGTAAACCTCTACAATGTGGTATGGAATTCTAAAATACAGCATAGCAAAC

3601 TTTAACCTCAAATCAAGCCTCTACTTGAATCCTTTCTGAGGGATGAATAAGGCATAGGCATCAGGGGCTGTTGCCAATGTGCATTAGCTGTTGCAGC

3701 CTCACCTTCTTCATGGAGTTTAAGATATAGTGTATTTCCCAAGTTTGAACAGCTCTTCATTTCTTTATGTTTTAAATGCACTGACCTCCACATTC

SspI (3812) SmaI (3826) EcoO109I (3887)

3801 CCTTTTTAGTAAATATTCAGAAATAATTTAAATACATCATTGCAATGAAAATAAATGTTTTTTATTAGGCAGAATCCAGATGCTCAAGGCCCTTCATAA

3901 TATCCCCAGTTTAGTAGTTGGAAGTGGGAAACAAAGGAACCTTTAATAGAAATTGGACAGCAAGAAAGCGAGCTTCTAGCTTTAGTCTCTGGTGTACTT
141▶ N R T Y K

4001 GAGGGGATGAGTTCCTCAATGGTGGTTTTGACCAGCTTGCCATTCATCTCAATGAGCACAAAGCAGTCAGGAGCATAGTCAGAGATGAGCTCTCTGCAC
135▶ L P I L E E I T T K V L K G N M E I L V F C D P A Y D S I L E R C

BstXI (4116)

4101 ATGCCACAGGGGCTGACCACCTGATGGATCTGTCCACCTCATCAGAGTAGGGGTGCCTGACAGCCACAATGGTGTCAAAGTCTTTCTGCCGTTGCTCA
101▶ M G C P S V V R I S R D V E D S Y P H R V A V I T D F D K Q G N S V

StuI (4251) Eco147I (4251)

4201 CAGCAGACCCAATGGCAATGGCTTCAGCACAGACAGTACCCTGCCAATGTAGGCCTCAATGTGGACAGCAGAGATGATCTCCCAGTCTTGGTCTGAT
68▶ A S G I A I A E A C V T V R G I Y A E I H V A S I I E G T K T R I

4301 GGCCGCCCCGACATGGTCTTGTGTCCTCATAGAGCATGGTGTCTTCTCAGTGGCGACCTCCACCAGCTCCAGATCCTGCTGAGAGATGTTGAAGTCT
35▶ A A G V H H K N D E Y L M T I K E T A V E V L E L D Q Q S I N F T

VspI (4459) AseI (4459)

BspHI (4401)

4401 TTCATGATGGCCCTCTATAGTGAAGTCTATTACTATGCGGATATACTATGCGGATGATTAATTGTCAAACAGCGTGATGGCGTCTCCAGCTTAT
1▶ K M

4500 CTGACGGTTCATAAACGAGCTCTGCTTATATAGACCTCCACCGTACACGCCTACCGCCATTTGCGTCAATGGGGCGGAGTTGTTACGACATTTTGGAA

SpeI (4614)

4600 AAGTCCCCTGATTACTAGTCAAAACAACTCCCATTTGACGTCAATGGGGTGGAGACTTGGAAATCCCCGTGAGTCAAACCGTATCCACGCCATTG

SnaBI (4742) Eco105I (4742)

4699 ATGTAAGTCCAAAACCGCATCATCATGGTAATAGCGATGACTAATACGTAGATGACTGCCAAGTAGGAAAGTCCATAAGGTCAATGACTGGGCATAAT

NdeI (4847)

4799 GCCAGGCGGGCCATTTACCGTCATTGACGTCAATAGGGGGCTACTTGGCATATGATACACTTGTACTGCCAAGTGGGCAGTTTACCGTAAATACTC

4899 CACCCATTGACGTCAATGAAAAGTCCCTATTGGCGTACTATGGGAACATACGTCAATTTGACGTCAATGGGCGGGGTCGTTGGGCGTCCAGCCAGGC

SdaI (5025) PacI (5033) BspLU11I (5043)

4999 GGGCCATTTACCGTAAGTTATGTAACGCCCTGCAGGTTAA TTAAGAACATGTGAGCAAAAGGCCAGCAAAGGCCAGGAACCGTAAAAAGGCCGCTTG

5097 CTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGG

5197 CGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTC

ApaLI (5357)

5297 TCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCGTTACAGCCCGACCCTGCCGCTTA

5397 TCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCG

5497 GTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAG

5597 AGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTTGTTTGAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAA

PacI (5773) SmaI (5782)

5697 GATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAAACGAAAACTCACGTTAAGGGATTTTGGTATGGCTAGTTAATTAACATTTAAATC AGCGG

5797 CCGCAATAAAATATCTTTATTTTATTACATCTGTGTGTTGGTTTTTTGTGTGAATCGTAACTAACATACGCTCTCCATCAAACAAAACGAAACAAAAC

5897 AACTAGCAAAATAGGCTGTCCCAGTGAAGTGCAGGTGCCAGAACATTTCTCTATCGAA