



PvuI (7)
SgfI (6) 1 GGATCTGGATCGCTCCGGTGCCCGTCAGTGGGAGAGCGCACATCGCCACAGTCCCGGAGAAGTTGGGGGAGGGGTGGCAATTGAACGGGTGCCTA
MfeI (82)
101 GAGAAAGTGGCGCGGGTAAACTGGAAAGTGATGTCGTGACTGGCTCCGCCTTTTTCCGAGGGTGGGGGAGAACCGTATATAAGTGCAGTAGTCGCC

Psp1406I (203) 201 GTGAACGTTCTTTTTCGCAACGGGTTTGCCGCCAGAACACAGCTGAAGCTTCGAGGGCTCGCATCTCTCTTACGCGCCCGCCCTACCTGAGGCC
HindIII (245)
301 GCCATCCAGCGCGGTTGAGTCGCGTTTCTGCCGCCTCCCGCTGTGGTGCCTCCTGAAGTGCCTCCGCCGTCTAGGTAAGTTAAAGCTCAGGTCGAGACC

401 GGGCCTTTGTCCGGCGCTCCCTTGAGCCCTACCTAGACTCAGCCGGCTCTCCACGCTTTGCTGACCCTGCTTCTCAACTCTACGCTTTTGTTCGTTT

501 TCTGTTTGTGCGCCGTTACAGATCCAAGCTGTGACCGGCGCCTACCTGAGATCACCGGTATCATGACGAGTGTCCGTTGCAAGCTGGCTCAGTATCTAGA
AgeI (552) 1 M T S V R C K L A Q Y L E
XbaI (594)

601 GGACCTTGAAGATGTGGACCTCAAGAAATTCAAAATGCATTTGGAAGATTACCCGCCGAGAAAGGCTGTATCCAGTCCCGAGGGCCAGATGGAGAAG
NsiI (634) 13 D L E D V D L K K F K M H L E D Y P P E K G C I P V P R G Q M E K
XcmI (680)

701 GCAGATCACTTGGATCTAGCCACACTCATGATTGACTTCAATGGTGGAGAGAAGGCTGGCCATGGCTGTGTGGATCTTTGCTGCGATCAACAGGCGAG
BspHI (725) 47 A D H L D L A T L M I D F N G E E K A W A M A V W I F A A I N R R
NcoI (761)

801 ACCTCTGGAAAAAGCTAAGAAGGACCAGCCAGAGTGGAAATGACACGTGCATCACATTCCTCTATGGTATGCCAGGAGGACAGCCTTGAAGAAGAGTG
BbrPI (843) 80 D L W E K A K K D Q P E W N D T C T S H S S M V C Q E D S L E E E W
EcoRV (914)

901 GATGGGTTTGTGGGATATCTCTCCGCATCTCCATTTGTA AAAAGAAGAAAGATTACTGTAAGATGTACAGACGACATGTGAGAAGCAGGTTCTACTCT
BspLU11I (975) 113 M G L L G Y L S R I S I C K K K K D Y C K M Y R R H V R S R F Y S
BsrBI (1093)

1001 ATCAAGGACAGGAACCGCGCTCTAGGTGAGAGTGTGGACCTCAACAGTCGCTACACGCGCTCCAAGTGGTCAAGGAGCATCCAAGCAAGCAGGAGCGGG
147 I K D R N A R L G E S V D L N S R Y T Q L Q L V K E H P S K Q E R
1101 AGCATGAACCTCTGACCATCGGCCGAGCTAAAATGCGGGACAGCCCATGAGTTCCCTTAAGCTGGAGCTGCTGTTTGAAGCCGAGGACGGGCACTCGGA
180 E H E L L T I G R T K M R D S P M S S L K L E L L F E P E D G H S E

1201 GCCTGTGCACACAGTGGTGTCCAGGGAGCAGCAGGCATCGGGAAAACCATCCTAGCCAGGAAGATTATGTTGGACTGGGCACTGGGAAAGCTTCTCAA
213 P V H T V V F Q G A A G I G K T I L A R K I M L D W A L G K L F K
1301 GACAAATTTGACTATTTGTTTCTTCCACTGCCGAGAGGTGAGCCTCAGGACGCCAAGGAGTCTAGCAGACCTGATTGTCAGCTGCTGGCCTGACCCAA
247 D K F D Y L F F I H C R E V S L R T P R S L A D L I V S C W P D P

1401 ACCCACCAGTGTGCAAGATCCTGCGCAAGCCTTCCAGGATCCTTTCCTCATGGATGGCTTTGATGAGCTACAAGGGGCTTTGACGAGCACATTGGGGA
280 N P P V C K I L R K P S R I L F L M D G F D E L Q G A F D E H I G E
1501 GGTCTGCACAGACTGGCAAAAGGCTGTGCGGGGAGACATTCTGTAAGCAGCCTCATCCGAAAGAAACTGCTGCCAAGGCCTCTCTGCTCATAACGACG
313 V C T D W Q K A V R G D I L L S S L I R K K L L P K A S L L I T T

1601 AGGCCGGTAGCCTTGAGAAAAGTGCAGCATCTCTGGACCACCCCGCATGTGGAGATCCTAGGTTTCTCTGAGGCCAAAAGGAAGGAGTATTTCTTTA
347 R P V A L E K L Q H L L D H P R H V E I L G F S E A K R K E Y F F
AvrII (1659)

1701 AGTATTTCTCAACGAGCTGCAGGCCGGGAGGCCTTCCAGGCTGATCCAAGAGAATGAGGTCTCTTTACCATGTGCTTCATCCCCCTGGTCTGCTGGAT
380 K Y F S N E L Q A R E A F R L I Q E N E V L F T M C F I P L V C W I
1801 TGTGTGCACGGGGCTAAAGCAACAGATGGAGACCGGGAAGAGCCTGGCCAGACCTCCAAGACCACTACGGCCGTCTACGTCTTCTTCTTTCCAGCCTG
413 V C T G L K Q Q M E T G K S L A Q T S K T T T A V Y V F F L S S L
1901 CTGCAATCCCGGGGCTTGAAGGAGCATCTTCTCTGACTACTACAGGCTCTGTTCCTGCTGCGGATGGAATTTGAACCAAGAAAATCCTAT
447 L Q S R G G I E E H L F S D Y L Q G L C S L A A D G I W N Q K I L

2001 TTGAGGAGTGTGATCTGCGGAAGCACGGCCTGCAGAAGACTGACGTCTCCGCTTTCTGAGGATGAACGTGTTCCAGAAGGAAGTGGACTGCGAGAGATT
480 F E E C D L R K H G L Q K T D V S A F L R M N V F Q K E V D C E R F
2101 CTACAGCTTCAGCCACATGACTTTCAGGAGTCTTCCGTGCTATGTACTATTTGCTGGAAGAGGAGGAGGAGGGGAGACCGTGAAGAAAGGACAGGA
513 Y S F S H M T F Q E F F A A M Y Y L L E E E A E G E T V R K G P G

2201 GGTGTTCCAGATCTTCTGAACCGAGACGTGAAGTCTACTAGAAAATTACGGCAAGTTTGA AAAAGGCTATCTGATTTTTGTTGTCGGATTCCTCTTTG
547 G C S D L L N R D V K V L L E N Y G K F E K G Y L I F V V R F L F
BglIII (2208)
BglIII (2351)

2301 GCCTGTAAACCAGGAGAGAACCTTTATTTGGAGAAGAACTAAGTTGCAAGATCTCTCAGCAAGTCAGACTGGAAGTACTGAGTGGATTGAAGTAA
580 G L V N Q E R T S Y L E K K L S C K I S Q Q V R L E L L K W I E V K
BstXI (2429)
NotI (2492)

2401 AGCCAAGGCCAAGAGCTGCAGTGGCAGCCAGCCAACTGGAAGTGTCTACTGCTGTACGAGATGCAGGAGGAAGACTTTGTGAGAGTGCATGGAC
613 A K A K K L Q W Q P S Q L E L F Y C L Y E M Q E E D F V Q S A M D
BbrPI (2542)

2501 CACTTTCCAAAATTGAGATCAACCTCTCTACCAGAATGGACCAGTGGTTTCTCTTTTGTATTAAGAAGTGTATAGGGTCAAACGCTTTCCCTGG
647 H F P K I E I N L S T R M D H V V S S F C I K N C H R V K T L S L
SalI (2648)

2601 GTTTTTTTCAAACTCGCCCAAGGAGGAAGAAGAGAGGAGGAGGAGTTCGACCTTGGACCAGGTTTCAAGTGTGTTTTCCAGACACTCATGTTGCCTG
680 G F F H N S P K E E E E E R R G G R P L D Q V Q C V F P D T H V A C

2701 TTCTTCCAGACTGGTGAAGCTGCTGCTCACTTCTAGCTTCTGCCGTGGTCTTCTCAAGTCTAAGCACCAACCGGAGCCTCACTGAACTGGACCTCAGT
713▶ S S R L V N C C L T S S F C R G L F S S L S T N R S L T E L D L S
2801 GACAATACTCTGGGAGACCCGGGCATGAGGGTCTGTGTGAGGCACTCCAGCACCAGGCTGTAACTCAGAGACTGTGGTGGGGCCTGCGGACTGT
747▶ D N T L G D P G M R V L C E A L Q H P G C N I Q R L W L G R C G L
2901 CCCATCAATGCTGCTTCGACATCTCTCTGTCTGAGCAGCAGCCAGAAGCTGGTGGAGCTGGACCTCAGTGACAATGCCCTGGGGGACTTTGGAATCAG
780▶ S H Q C C F D I S S V L S S S Q K L V E L D L S D N A L G D F G I R
3001 ATTGCTGTGTGGGACTGAAGCACCTGCTCTGCAACCTCCAGAACTGTGGTGGTGGAGCTGCTGTCTCACATCCGCGTGTGTGAGGATCTCGCATTG
813▶ L L C V G L K H L L C N L Q K L W L V S C C L T S A C C Q D L A L L
3101 GTTCTGAGCTCAACCACTTCTGACCACTGTACATTGGAGAAAATGCCTTGGGAGACTCAGGAGTCCAAGTTTTGTGAAAAGATGAAGGACCCAC
847▶ V L S S N H S L T R L Y I G E N A L G D S G V Q V L C E K M K D P

EcoRI (3228)

3201 AGTGTAAGTTCGAGAAGCTGGGGTGGTGAATCCGGCCTTACTTCAATCTGTTGTTGAGCTCTGACCTGTGCTCAAACCAACCAGAAGCTTCAACA
880▶ Q C N L Q K L G L V N S G L T S I C C S A L T S V L K T N Q N F T H
3301 CCTCTATCTACGAAGCAATGCCCTTGGAGACACAGGACTCAGGCTCCTCTGTGAGGGCTTCTGCACCCGACTGTAACTACAGATGCTGGAATTAGAC
913▶ L Y L R S N A L G D T G L R L L C E G L L H P D C K L Q M L E L D
3401 AACTGCAGCTCACCTCACAGCTGCTGGAATCTCTCCAAATCTGACCCACAACCCACAGCCTTCGGAAGCTGAACCTGGGCAACAATGATCTTGGCG
947▶ N C S L T S H S C W N L S T I L T H N H S L R K L N L G N N D L G

BstEII (3510)

3501 ATCTGTGGTGGTGGACCTCTGTGAGGTGCTGAAACAGCAGGGCTGCCTCCTGCAGAGCTACAGTTGGTGAAATGACTTAAATCGTGAAACAAAACG
980▶ D L C V V T L C E V L K Q Q G C L L Q S L Q L G E M Y L N R E T K R

Eco47III (3609)

BamHI (3661)

3601 TGCCTTAGAAGCGCTCCAGGAAGAAAAGCCTGAGCTGACTATAGTCTTCGAGATTTCTGGGATCCTATCCCTATGATGTGCCAGACTATGCTGGCTAT
1013▶ A L E A L Q E E K P E L T I V F E I S W G S Y P Y D V P D Y A G Y

MscI (3764)

NdeI (3701)

NheI (3758)

3701 CCATATGATGTTCTGATTATGCTGGATACCCTTATGATGTGCCAGACTATGCCTAAAGCTAGCTGGCCAGACATGATAAGATACATTGATGAGTTTGA
1047▶ P Y D V P D Y A G Y P Y D V P D Y A •

HpaI (3896)

3801 CAAACCACAAGTGAATGCAGTGAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAAACAAAGTTA

MfeI (3907)

EcoRI (3992)

3901 ACAACAACAATTGCATTTTATGTTTCAGGTTTCAGGGGAGGTGTGGGAGGTTTTTAAAGCAAGTAAAACCTCTACAAATGTGGTATGGAATTCTA

4001 AAATACAGCATAGCAAACTTTAACTCCAAATCAAGCCTCTACTTGAATCCTTTTCTGAGGGATGAATAAGGCATAGGCATCAGGGGCTGTTGCCAATG

4101 TGCATTAGCTGTTTGACGCTCACCTTCTTTCATGGAGTTAAGATATAGTGATTTTCCCAAGGTTTGAAGTAGCTCTTCATTTCTTTATGTTTAAAT

SspI (4231)

SwaI (4245)

4201 GCACTGACCTCCACATTCCTTTTTAGTAAAATATTCAGAAAATAATTTAAATACATCATTGCAATGAAAATAAATGTTTTTATTAGGCAGAATCCAGA

4301 TGCTCAAGGCCCTCATAATATCCCCAGTTTAGTAGTTGGACTTAGGGAACAAGGAACCTTTAATAGAAATTTGGACAGCAAGAAAGCGAGCTTCTAGC

4401 TTTAGTTCCTGGTACTTGAGGGGATGAGTTCTCAATGGTGGTTTTGACCAGCTTGCATTATCTCAATGAGCACAAAGCAGTCAGGAGCATAGTC
141◀ • N R T Y K 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

BstXI (4535)

4501 AGAGATGAGCTCTCTGCACATGCCACAGGGGCTGACCCTGATGGATCTGTCCACCTCATCAGAGTAGGGGTGCCTGACAGCCACAATGGTGTCAAAG
108◀ S I L E R C 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

4601 TCCTTCTGCCGTTGCTCACAGCAGACCAATGGCAATGGCTTTCAGCAGACAGTGCCTGCAATGTAGGCTCAATGTGGACAGCAGAGATGATCT
74◀ D K Q G N S V 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

4701 CCCAGTCTTGGTCTGATGGCCGCCGACATGGTGTCTTGTCTCATAGAGCATGGTGTCTTCTCAGTGGCGACCTCCACCAGCTCCAGATCCTG
41◀ G T K T R I 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

BspHI (4820)

XmnI (4812)

AseI (4878)

4801 CTGAGAGATGTTGAAGGTCTTCAATGATGGCCCTCCTATAGTGAGTCGTATTATACTATGCCGATATACTATGCCGATGATTAATTGTCAAACACAGCGTGG
8◀ Q S I N F T K M

4901 ATGGCGTCTCCAGCTTATCTGACGGTTCACTAAACGAGCTCTGCTTATATAGACCTCCACCGTACACGCTACCGCCATTGCGTCAATGGGCGGA

SpeI (5033)

5000 GTTGTACGACATTTTGGAAAGTCCCGTTGATTTACTAGTCAAACAAACTCCCATTGACGTCAATGGGGTGGAGACTTGGAAATCCCCGTGAGTCAA

SnaBI (5161)

5099 CCGCTATCCAGCCATTGATGACTGCCAAAACCGCATCATCATGGTAATAGCGATGACTAATACGTAGATGACTGCCAAGTAGGAAAGTCCATAAG

NdeI (5266)

5199 GTCATGACTGGGCATAATGCCAGCGGGCCATTTACCCTCATTGACGTCAATAGGGGGCTACTTGGCATATGATACTTGTACTGCAAGTGGG

5299 CAGTTTACCGTAAATACTCCACCAATTGACGTCAATGGAAAGTCCCTATTGGCGTTACTATGGGAACATACGTCAATTATTGACGTCAATGGGCGGGGTC

SdaI (5444)

PacI (5452)

BspLU11I (5462)

5399 GTTGGGCGGTGAGCCAGCGGGCCATTTACCGTAAAGTTATGTAACCGCTG C A G G T T A A T T A A G A A C A T G T G A G C A A A A G G C C A G A A A G G C C A G G A A

5497 CCGTAAAAAGGCCGCTTGTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAATAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACA

5597 GGACTATAAAGATACCAGCGTTTTCCCTGGAAGCTCCCTCGTGCCTCTCTGTTCCGACCCTGCCGTTACCGGATACCTGTCCGCTTTCTCCCTT

5697 CGGGAAGCGTGGCGCTTTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCGTTCA
5797 GCCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGC
5897 AGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGC
5997 CAGTTACCTTCGGAAAAAGATTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGGTTTGAAGCAGCAGATTACGCGCAG

6097 AAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGTCTGACGCTCAGTGGAACGAAAACCTCACGTTAAGGGATTTTGGTCATGGCTAGTTAA PacI (6192)

Swal (6201) **NotI (6211)**

6197 TTAACATTTAAATC AGCGGCCCAATAAAATATCTTTATTTTATTACATCTGTGTGTTGGTTTTTTTGTGTGAATCGTAACTAACATACGCTCTCCATCA
6297 AAACAAAACGAAACAAAACAAACTAGCAAAATAGGCTGTCCCCAGTGCAAGTGCAGGTGCCAGAACATTTCTCTATCGAA