



**PvuI (7)**  
**SgfI (6)** 1 GGATCTGGATCGCTCCGGTGCCCGTCAGTGGGAGAGCGCACATCGCCACAGTCCCCGAGAAGTTGGGGGAGGGGTGGCAATTGAACGGGTGCCTA  
**MfeI (82)**  
101 GAGAAGTGGCGCGGGTAAACTGGAAAGTGATGTCGTGACTGGTCCGCCTTTTCCGAGGGTGGGGGAGAACCCTATATAAGTGCAGTAGTCGCC

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**Psp1406I (203)** **PvuII (239)** **Bsu36I (291)**  
201 GTGAACGTTCTTTTTCGCAACGGGTTTGCCGCCAGAACACAGCTGAAGCTTCGAGGGCTCGCATCTCTCTTACGCGCCCGCCCTACCTGAGGCC  
301 GCCATCCACGCCGGTTGAGTCGCGTTTCTGCCGCCTCCCGCTGTGGTGCCTCCTGAAGTGCCTCCGCCGTCTAGGTAAGTTTAAAGCTCAGGTCGAGACC

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**NgoMI (441)** **NaeI (441)**  
401 GGGCCTTTGTCCGGCGCTCCCTTGAGCCTACCTAGACTCAGCCGGCTCTCCACGCTTTGCTGACCCTGCTTGTCAACTCTACGCTTTTGTTCGTTT

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**NcoI (560)** **BstEII (555)**  
501 TCTGTTCTGCGCCGTTACAGATCCAAGCTGTGACCGGGCCCTA CCGT GAGATCACCGGT CACCATGGGAATGGCCTGCCTTACGATGACAGAAATGGAGGG  
601 AACATCCACCTCTTCTATATACAGAATGGTGATATTTCTGGAATGCCAATTCTATGAAGCAATAGATCCAGTTCCTCAGGTGTATCTTTACCAATCC  
13> T S T S S I Y Q N G D I S G N A N S M K Q I D P V L Q V Y L Y H S  
701 CTTGGAAATCTGAGGCAGATTATCTGACCTTTCCATCTGGGGAGTATGTTGCAGAAGAAATCTGTATTGCTGCTTAAAGCTTGGTATCACACCTG  
47> L G K S E A D Y L T F P S G E Y V A E E I C I A A S K A C G I T P  
801 TGTATCATAATATGTTTGTCTTAATGAGTGAACAGAAAGGATCTGGTATCCACCAACCATGCTTCCATATAGATGAGTCAACCAGGCATAATGTACT  
80> V Y H N M F A L M S E T E R I W Y P P N H V F H I D E S T R H N V L

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**XhoI (971)**  
901 CTACAGAATAAGATTTTACTTTCTCGTTGGTATTGCAGTGGCAGCAACAGAGCCTATCGGCATGGAATATCTCGAGGTGCTGAAGCTCCTCTTCTTGAT  
113> Y R I R F Y F P R W Y C S G S N R A Y R H G I S R G A E A P L L D

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**Tth111I (1000)** **ApaLI (1045)**  
1001 GACTTTGTCATGCTTACCTCTTTGCTCAGTGGCGCATGATTTGTGCACGGATGGATAAAAAGTACCTGTGACTCATGAAACACAGGAAGAATGCTTGG  
147> D F V M S Y L F A Q W R H D F V H G W I K V P V T H E T Q E E C L  
1101 GGATGGCAGTGTTAGATATGATGAGAATAGCCAAAGAAAACGATCAAACCCACTGGCCATCTATAACTCTATCAGCTACAAGACATTCTTACAAAATG  
180> G M A V L D M M R I A K E N D Q T P L A I Y N S I S Y K T F L P K C  
1201 TATTCGAGCAAAGATCCAAGACTATCATATTTGACAAGGAAGCGAATAAGGTACAGATTTCCGAGATTTATTCAGCAATTGACGCAATGCAAAGCCACT  
213> I R A K I Q D Y H I L T R K R I R Y R F R F I Q Q F S Q C K A T  
1301 GCCAGAACTTGAACCTTAAGTATCTTATAAATCTGGAACCTGTCAGTCTGCCTTCTACACAGAGAAATTTGAAGTAAAAGAACCTGGAAGTGGTCCTT  
247> A R N L K L K Y L I N L E T L Q S A F Y T E K F E V K E P G S G P

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**EcoRI (1445)**  
1401 CAGGTGAGGAGATTTTTGCAACCATTATAATAACTGGAACCGTGGAAATTCAGTGGTCAAGAGGAAACATAAAGAAAGTGAAGACTGACAGAACAGGA  
280> S G E E I F A T I I I T G N G G I Q W S R G K H K E S E T L T E Q D

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**XcmI (1593)**  
1501 TTTACAGTTATATTGCGATTTTCTAATATTATTGATGTGCTAGTATTAAGCAAGCAACCAAGAGGGTTCAAATGAAAGCCGAGTTGTAAGTATCCATAAG  
313> L Q L Y C D F P N I I D V S I K Q A N Q E G S N E S R V V T I H K  
1601 CAAGATGGTAAAACTGGAATTTGAACCTTAGCTCATTAAAGGGAAGCTTTGTCTTCTGTTGTCATTAATTTAGTGGATATTATAGATTAAGTGCAGTGCAC  
347> Q D G K N L E I E L S S L R E A L S F V S L I D G Y Y R L T A D A  
1701 ATCATTACCTCTGTAAGAAGTAGCACCTCCAGCCGCTTGAATAATACAAAGCAACTGTCATGGCCCAATTTGATGGATTTTGGCATTAGTAAACT  
380> H H Y L C K E V A P P A V L E N I Q S N C H G P I S M D F A I S K L

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**Bsu36I (1846)**  
1801 GAAGAAAGCAGGTAATCAGACTGGACTGTATGACTTCGATGCAGTCCCTAAGGACTTTAATAAATATTTTTGACTTTTGTGCTGCGAGCGAGAAAATGTC  
413> K K A G N Q T G L Y V L R C S P K D F N K Y F L T F A V E R E N V  
1901 ATTGAATATAAACTGTTTATTACAAAAATGAGAATGAAGAGTACAACCTCAGTGGGACAAAAGAACTTCAGCAGTCTTAAAGATCTTTTGAATT  
447> I E Y K H C L I T K N E N E E Y N L S G T K K N F S S L K D L L N  
2001 GTTACCAGATGAAAAGTTCGCTCAGACAATAATTTCCAGTTTACTAAATGCTGTCCCCAAAAGCAAAAAGATAAATCAAACCTTCTAGTCTTCAG  
480> C Y Q M E T V R S D N I I F Q F T K C C P P K P K D K S N L L V F R  
2101 AACGAATGGTGTCTGATGTACCAACCTACCAACATTACAGAGGCCTACTCATATGAACCAATGGTGTTCACAAAATCAGAAATGAAGATTTGATA  
513> T N G V S D V P T S P T L Q R P T H M N Q M V F H K I R N E D L I

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**BsiWI (2247)** **PshAI (2266)**  
2201 TTTAATGAAAGCCTTGGCCAAGGCACTTTTACAAAGATTTTTAAAGGCTACGAAGAGAAAGTAGGAGACTACGGTCAACTGCATGAAACAGAAGTTCTTT  
547> F N E S L G Q G T F T K I F K G V R R E V G D Y G Q L H E T E V L  
2301 TAAAAGTTCTGGATAAAGCACACAGAACTATTAGAGTCTTTCTTTGAAGCAGCAAGTATGATGAGCAAGCTTTCTCACAAGCATTGGTTTTAAATTA  
580> L K V L D K A H R N Y S E S F F E A A S M M S K L S H K H L V L N Y  
2401 TGGAGTATGTGCTGTGGAGACGAGAATATTCTGGTTCAGGAGTTTGTAAAATTTGGATCACTAGATACATATCTGAAAAAGAATAAAAAATTGTATAAT  
613> G V C V C G D E N I L V Q E F V K F G S L D T Y L K K N K N C I N

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**Ppu10I (2542)** **NsiI (2542)** **XbaI (2550)**  
2501 ATATTATGAAACTTGAAGTTGCTAAACAGTTGGCATGGGCCATGCATTTTCTAGAAGAAAACCCCTTATTTCATGGGAATGTATGTGCCAAAAATATTC  
647> I L W K L E V A K Q L A W A H F L E E N T L I H G N V C A K N I  
2601 TGCTTATCAGAGAAGAAGACAGGAAGACAGGAAATCCTCTTTTCATCAAACTTAGTGATCCTGGCATTAGTATTACAGTTTTGCAAAAGGACATTCTTCA  
680> L L I R E E D R K T G N P P F I K L S D P G I S I T V L P K D I L Q

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**Asp718I (2715)** **Ppu10I (2727)** **DraIII (2784)**  
2701 GGAGAGAATACCATGGTACCCTGAATGCATTGAAAAATCCTAAAAATTTAAATTTGGCAACAGACAAATGGAGTTTTGGTACCACCTTTGGGAAATC  
713> E R I P W V P P E C I E N P K N L N L A T D K W S F G T T L W E I

2801 TGCAGTGGAGGAGATAAACCTCTAAGTGTCTGGATTCTCAAAGAAAGCTACAATTTTATGAAGATAGGCATCAGCTTCTGCACCAAAGTGGGCAGAAT  
747▶ C S G G D K P L S A L D S Q R K L Q F Y E D R H Q L P A P K W A E  
2901 TAGCAAACCTTATAAATAATTGTATGGATTATGAACAGATTTTCAGGCTTCTTTTCAGAGCCATCATACGAGATCTTAACAGTTTGTTTACTCCAGATTA  
780▶ L A N L I N N C M D Y E P D F R P S F R A I I R D L N S L F T P D Y

PciI (3020)

BspLU11I (3020)

AvrII (3048)

BamHI (3078)

3001 TGAACATTAACAGAAAAAGACATGTTACCAAATATGAGGATAGGTGCCTTAGGGTTTTCTGGTGCCTTTGAAGACCCGGGATCCACACAGTTTGAAGAG  
813▶ E L L T E N D M L P N M R I G A L G F S G A F E D R D P T Q F E E  
3101 AGACATTTGAAATTTCTACAGCAACTTGGCAAGGGTAATTTTGGGAGTGTGGAGATGTGCCGGTATGACCCTCTACAGGACAACACTGGGGAGGTGGTCG  
847▶ R H L K F L Q Q L G K G N F G S V E M C R Y D P L Q D N T G E V V

ScaI (3220)

3201 CTGTAAAAAGCTTCAAGAGCCTAAGAGACTTTGAAAGGGAAATTGAAATCCTGAAATCCCTACAGCATGACAACATTGTAAAGTA  
880▶ A V K K L Q H S T E E H L R D F E R E I E I L K S L Q H D N I V K Y  
3301 CAAGGGAGTGTGTACAGTGTGGTCCGCGTAATCTAAAATTAATTATGGAATATTTACCATATGGAAGTTTACGAGACTATCTTCAAAAACATAAAGAA  
913▶ K G V C Y S A G R R N L K L I M E Y L P Y G S L R D Y L Q K H K E  
3401 CGGATAGATCACATAAACTTCTGCAGTACACATCTCAGATATGCAAGGGTATGGAGTATCTTGGTACAAAAGGTATATCCACAGGGATCTGGCAACGA  
947▶ R I D H I K L L Q Y T S Q I C K G M E Y L G T K R Y I H R D L A T

HpaI (3549)

SexAI (3597)

3501 GAAATATATTGGTGGAGAACGAGAACAGAGTTAAAATTGGAGATTTTGGGTTAACCAAAGTCTTGCCACAAGACAAAGAATACTATAAAGTAAAAAGAAC  
980▶ R N I L V E N E N R V K I G D F G L T K V L P Q D K E Y Y K V K E P  
3601 TGGTGAAGTCCCATATTTCTGGTATGCTCCAGAATCACTGACAGAGCAAGTTTCTGTGGCCTCAGATGTTTGGAGCTTTGGAGTGGTTCTGTATGAA  
1013▶ G E S P I F W Y A P E S L T E S K F S V A S D V W S F G T G V V L Y E  
3701 CTTTTACATACATTGAGAAGATAAAGTCCACCAGCGAATTTATGCGTATGATTGGAATGACAAACAGGACAGATGATCGTGTCCATTTGATG  
1047▶ L F T Y I E K S K S P P A E F M R M I G N D K Q G Q M I V F H L I  
3801 AACTTTTGAAGAATAATGGAAGATTACCAAGACCAGATGGATGCCAGATGAGATCTATATGATCATGACAGAATGCTGGAACAATAATGTAATCAACG  
1080▶ E L L K N N G R L P R P D G C P D E I Y M I M T E C W N N N V N Q R

NheI (3982)

3901 CCCCTCTTTAGGGATCTAGCTCTTCGAGTGGATCAAATAAGGGATAACATGGCTGGATGAAAGAAATGACCTTCATTCTGAGCTAGCTGGCCAGACATG  
1113▶ P S F R D L A L R V D Q I R D N M A G •  
4001 ATAAGATACATTGATGAGTTTGGACAAACCACAACCTAGAAATGCAGTGAAGAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAACCA

HpaI (4120)

MfeI (4131)

4101 TTATAAGCTGCAATAAACAAAGTTAAACAACAACAAATTGCATTCATTTTTATGTTTCAGGTTCAAGGGGAGGTGTGGGAGGTTTTTTAAAGCAAGTAAACCT

EcoRI (4216)

4201 CTACAAATGTGGTATGGAATCTAAAATACAGCATAGCAAACTTTAACCTCCAAATCAAGCCTCTACTTGAATCCTTTTCTGAGGGATGAATAAGGCAT  
4301 AGGCATCAGGGGCTGTTGCCAATGTGCATTAGCTGTTGCAGCCTCACCTTCTTCATGGAGTTAAGATATAGTGTATTTTCCCAAGTTTGAAGTACG  
4401 TCTTCATTTCTTTATGTTTTAAATGCACTGACCTCCCACATTCCTTTTTAGTAAAATATTCAGAAATAATTTAAATACATCATTGCAATGAAAAATAAT

EcoO109I (4530)

4501 GTTTTTTATTAGGCAGAATCCAGATGCTCAAGGCCCTTCATAATATCCCCAGTTTAGTAGTTGGACTTAGGGAACAAAGAACCTTTAATAGAAATGG  
4601 ACAGCAAGAAAGCGAGCTTCTAGCTTTAGTTCTGGTGTACTTGGGGGATGAGTTCCTCAATGGTGGTTTTGACCAGCTTGCATTTCATCTCAATGAG  
144▶ • N R T Y K L P I L E E I T T K V L K G N M E I L

SacI (4730)

4701 CACAAAGCAGTCAGGAGCATAGTCAGAGATGAGCTCTCTGCATGCCACAGGGGCTGACCACCTGATGGATCTGTCCACCTCATCAGAGTAGGGGTGC  
116▶ V F C D P A Y D 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  
4801 CTGACAGCCACAATGGTGTCAAAGTCTTCTGCCGCTTCTCAGCAGACCAATGGCAATGGCTTCAAGCAGCAGTGCCTGCCAATGTAGGCCT  
82▶ R V A V I T D F 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  
4901 CAATGTGGACAGCAGAGATGATCTCCCCAGTCTTGGTCTGATGGCCGCCCGACATGGTCTTGTGCTCATAGAGCATGGTGTCTTCTCAGTGGC  
49▶ I H V A S I I E 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  
5001 GACCTCCACAGCTCCAGATCCTGCTGAGAGATGTTGAAGGTCTTCATGATGGCCCTCTATAGTGTGCTATTATACTATGCCGATATACTATGCCGA  
16▶ V E V L E L D Q Q S I N F T K M

SacI (5159)

5101 TGATTAATTTGCAAAACAGCGTGGATGGCGTCTCCAGCTTATCTGACGGTCACTAAACGAGCTCTGCTTATATAGACCTCCACCGTACACGCCTACC

SpeI (5257)

5200 GCCCATTGCGTCAATGGGGCGGAGTTGTTACGACATTTTGGAAAGTCCCCTGATTACTAGTCAAAAACAACTCCCATTGACGTCAATGGGGTGGAG

SnaBI (5385)

Eco105I (5385)

5299 ACTTGAAATCCCCTGAGTCAAACCGCTATCCACGCCATTGATGTAAGTCCAAAACCGCATCATCATGGTAATAGCGATGACTAATACGTAGATGTAC  
5399 TGCCAAGTAGGAAAGTCCATAAGGTCTGTAAGTGGGCATAATGCCAGCGGGCCATTACCCTGATTGACGTCAATAGGGGGCTACTTGGCATATGAT  
5499 ACACCTGATGTAAGTCCAAAGTGGGAGTTACCCTAAATACTCCACCCATTGACGTCAATGGAAGTCCCTATTGGCGTTACTATGGGAACATACGTCAT

PciI (5686)

SdaI (5668)

PacI (5676)

BspLU11I (5686)

5599 TATTGACGTCAATGGGCGGGGCTGTTGGCGGTGACCCAGCGGGCCATTTACCCTAAGTTATGTAACCGCTGCAGGTTAAATAAGCAACATGTGAGC  
5697 AAAAGGCCAGCAAAGGCCAGGAACCGTAAAAAGCCCGGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAATCGACGCTCA

5797 AGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCG

5897 GATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCCGCTCCAAGCTGGG

ApaLI (6000)

5997 CTGTGTGCACGAACCCCCGTTACGCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCA

6097 GCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGAACAGTAT

6197 TTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGTTTTTTTGT

6297 TTGCAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACCTCACGTTAA

EagI (6436)

PacI (6416)

NotI (6435)

6397 GGGATTTTGGTCATGGCTAGTTAATTAACATTTAAATC AGCGGCCGCAATAAAATATCTTTATTTTCATTACATCTGTGTGTTGTTTTTGTGTGAATC

6497 GTAACATAACATACGCTCTCCATCAAACAAAACGAAACAAAACAACTAGCAAATAGGCTGTCCCAGTGCAAGTGCAGGTGCCAGAACATTTCTCTAT

6597 CGAA