



**PvuI (7)**  
**SgfI (6)** 1 GGATCTGGATCGCTCCGGTGCCCGTCAGTGGGAGAGCGCACATCGCCACAGTCCCGGAGAAGTTGGGGGAGGGGTGGCAATTGAACGGGTGCCTA  
**MfeI (82)** **EcoNI (96)**  
101 GAGAAGGTGGCGGGGTAAGTGGAAAGTGATGTCGTGACTGGTCCGCCTTTTCCGAGGGTGGGGGAGAACCCTATATAAGTGCAGTAGTCGCC

**HindIII (245)** **Bsu36I (291)**  
**Psp1406I (203)** **PvuII (239)** **EcoNI (287)**  
201 GTGAACGTTCTTTTTTCGCAACGGGTTTCCGCCAGAACACAGCTGAAGCTTCGAGGGGCTCGCATCTCTCTTACCGCCGCCGCCCTACCTGAGGCC  
301 GCCATCCACGCCGGTTGAGTGCAGTCTGCCGCCTCCCGCCTGTGGTGCCTCTGAACTGCGTCCGCCGTCTAGGTAAGTTTAAAGCTCAGGTCGAGACC

**NgoMIV (441)**  
401 GGGCCTTTGTCCGGCGCTCCCTTGGAGCCTACCTAGACTCAGCCGGCTCTCCACGCTTTGCTGACCCTGCTTGTCTCAACTCTACGTCTTTGTTTCGTTT

**KasI (535)** **AgeI (552)**  
501 TCTGTTTGTCCGCCGTTACAGATCCAAGCTGTGACCGGCCCTACCTGAGATCACCGGTCAACATGTCTGACAGTGGATCACAACCTGGTTCAATGGGTAG  
1 M S D S G S Q L G S M G S  
**SnaBI (685)**

**Tth111I (674)**  
601 CCTCACCATGAAATCACAGTTCAGATCACTGTCTCAGCAAACTTAAGGAAAATAAGAAGAATTGGTTGGACCAAGTCTTACGTAGAGGTCACA  
13 L T M K S Q L Q I T V I S A K L K E N K K N W F G P S P Y V E V T  
701 GTAGATGGACAGTCAAAGAAGACAGAAAAATGCAACAACACAAACAGTCCCAAGTGAAGCAACCCCTTACAGTTATCGTTACCCCTGTGAGTAAATTAC  
47 V D G Q S K K T E K C N N T N S P K W K Q P L T V I V T P V S K L  
801 ATTTTCGTGTGGAGTACCAGACTGAAATCTGATGTTTTGTTGGAACTGCTGCATTAGATATTTATGAAACATTAAGTCAAACAATATGAACT  
80 H F R V W S H Q T L K S D V L L G T A A L D I Y E T L K S N N M K L  
901 TGAAGAAGTAGTTGTGACTTTGCAGCTTGGAGGTGACAAAGAGCCAACAGAGACAATAGGAGACTTGTCAATTTGCTTGTGATGGGCTACAGTTAGAGTCT  
113 E E V V V T L Q L G G D K E P T E T I G D L S I C L D G L Q L E S  
1001 GAAGTTGTTACCAATGGTAAACTACATGTTGAGAAA GTGCTTCTCAGAATGATGATGGCTCCAGATCCAAGGATGAAACAAGAGTGAGCACAAATGGA  
147 E V V T N G E T T C S E S A S Q N D D G S R S K D E T R V S T N G

**XbaI (1189)**  
1100 TCAGATGACCCTGAAGATGCAGGAGCTGGTGAATAAGGAGAGTCACTGCGAATAATTCTCCATCACTCTCAAATGGTGGTGTAAAACTTCTAGACCTC  
180 S D D P E D A G A G E N R R V S G N N S P S L S N G G F K P S R P  
1200 CAAGACCTTACAGACCACCACCACCCACCCAGTACAGCAGCATCTGTCAATGGTCCACCATCTGCCACTTCTGAAAGTGATGGGTCTAGTACAGGCTC  
213 P R P S R P P P P T P R R P A S V N G S P S A T S E S D G S S T G S

**AseI (1350)** **AvrII (1387)**  
1300 TCTGCCGCCGACAAATACAAATACAAATACATCTGAAGGAGCAACATCTGGATTAATAATTCTCTTACTATATCTGGAGGCTCAGGCCCTAGGCCATTA  
246 L P P T N T N T N T S E G A T S G L I I P L T I S G G S G P R P L  
1400 AATCCTGTAACCTCAAGCTCCCTTCCACCTGGTGGGAGCAGAGAGTGGACCAGCAGCGGGCGAGTTACTATGTAGATCATGTTGAGAAAAGAACAACAT  
280 N P V T Q A P L P P G W E Q R V D Q H G R V Y Y V D H V A E A K R T T  
1500 GGGATAGACAGAACTCTACTCTGGCTGGGACCGCGGGTTGACAACATGGGACGTATTTATTATGTTGACCATTTCACAAGAACAACCTGGCA  
313 W D R P E P L P P G W E R R V D N M G R I Y Y V D H F T R T T T W Q

**BspEI (1619)**  
1600 GAGGCCAACACTGGAATCCGTCGGAACTATGAACAATGGCAGCTACAGCGTAGTCAAGGAGCAATGCAGCAGTTTAAACCAGAGATTCATTTAT  
346 R P T L E S V R N Y E Q W Q L Q R S Q L Q G A M Q Q F N Q R F I Y  
1700 GGGAAATCAAGATTTATTTGCTACATCACAAAGTAAAGAATTTGATCCTCTTGGTCCATTGCCACTGGATGGGAGAAGAGAACAGACAGCAATGGCAGAG  
380 G N Q D L F A T S Q S K E F D P L G P L P P G W E K R T D S N G R  
1800 TATATTTGCTCAACCACAACACGAATTACACAAATGGGAAAGCCCCAGAAAGTCAAGGTCATTAATGAAAAGCCCTTACCTGAAGTTGGGAAATGAG  
413 V Y F V N H N T R I T Q W E D P R S Q G Q L N E K P L P E G W E M R

**EcoRI (1913)**  
1900 ATTCACAGTGGATGGAATTCATATTTTGTGGACCACAATAGAAGAACTACCACCTATATAGATCCCCGCACAGGAAAATCTGCCCTAGACAATGGACCT  
446 F T V D G I P Y F V D H N R R T T T Y I D P R T G K S A L D N G P

**MscI (2063)**  
2000 CAGATAGCCTATGTTCCGGACTTCAAAGCAAAGTTTCAAGTATTTCCGGTCTGGTGTGACGCAACTGGCCATGCCACAGCACATAAAGATTACAGTGACAA  
480 Q I A Y V R D F K A K V Q Y F R F W C Q Q L A M P Q H I K I T V T

**BglIII (2151)**  
2100 GAAAAACATTGTTTGGAGGATTCCTTTCAACAGATAATGAGCTTCCAGTCCCAAGATCTGCGAAGACGTTTGTGGGTGATTTTTCCAGGAGAAGAAGGTTT  
513 R K T L F E D S F Q Q I M S F S P Q D L R R R L W V I F P G E E G L  
2200 AGATTATGGAGGTGAGCAAGAGAATGGTTCTTTCTTTGTCACATGAAGTGGTGAACCAAGTATTTGCTGTTGAATATGAGGTTGAAATGAGGATAAATCTAC  
546 D Y G G V A R E W F F L L S H E V L N P M Y C L F E Y A G K D N Y

**NcoI (2375)** **NcoI (2388)**  
2300 TGCTTGCAGATAAACCCCGCTTCTTACATCAATCCAGATCACCTGAAATATTTTTCGTTTTATTGGCAGATTTATTGCCATGGCTCTGTTCCATGGGAAAT  
580 C L Q I N P A S Y I N P D H L K Y F R F I G R F I A M A L F H G K  
2400 TCATAGACACGGGTTTTTACCATTCTATAAGCGTATCTTGAACAACAGTGGACTCAAGGATTTAGAATCTATTGATCCAGAAATTTTCAAACTTCC  
613 F I D T G F S L P F Y K R I L N K P V G L K D L E S I D P E F Y N S

**BspHI [m] (2589)**  
2500 TCTCATCTGGGTTAAGGAAAACAATATTGAGGAATGTGATTTGGAAATGTACTTCTCCGTTGACAAAGAAATCTAGGTGAAATTAAGAGTCATGATCTG  
646 L I W V K E N N I E E C D L E M Y F S V D K E I L G E I K S H D L

**XhoI (2678)**  
2600 AAACCTAATGGTGGCAATATTCTTGTAAACAGAAGAAAATAAAGAGGAATACATCAGAATGGTAGCTGAGTGGAGGTTGTCTCGAGGTGTTGAAGAACAGA  
680 K P N G G N I L V T E E N K E E Y I R M V A E W R L S R G V E E Q

**HindIII (2702)** **XmnI (2725)**  
2700 CACAAGCTTTCTTGAAGGCTTTAATGAAATCTTCCCGCAGCAATATTTGCAATACTTTGATGCAAAGGAATTAAGAGTCTTTTATGTGGAATGCAAGA  
713 T Q A A F F E G F N E I L P Q Q Y L Q Y F D A K E L E V L L C G M Q E

2800 GATTGATTTGAATGACTGGCAAAGACATGCCATCTACCGTCATTATGCAAGGACCAGCAAACAATCATGTGGTTTTGGCAGTTTGTAAAGAAATTGAT  
746▶ I D L N D W Q R H A I Y R H Y A R T S K Q I M W F W Q F V K E I D

PstI (2920)

2900 AATGAGAAGAGAATGAGACTTCTGCAGTTTGTACTGGAACCTGCCGATTGCCAGTAGGAGGATTTGCTGATCTCATGGGGAGCAATGGACCACAGAAT  
780▶ N E K R M R L L Q F V T G T C R L P V G G F A D L M G S N G P Q K

3000 TCTGCATTGAAAAAGTTGGGAAAGAAAATTGGCTACCCAGAAGTCATACCTGTTTTAATCGCCTGGACCTGCCACCATAACAAGAGCTATGAGCAACTGAA  
813▶ F C I E K V G K E N W L P R S H T C F N R L D L P P Y K S Y E Q L K

MscI (3181)

3100 GGAAAAGCTGTTGTTTGGCATAGAAGAAACAGAAGGATTTGGACAAGAGTAACCTCTGAGAACTGCACCATGAATGCTAGCTGGCCAGACATGATAAGA  
846▶ E K L L F A I E E T E G F G Q E •

NheI (3175)

3200 TACATTGATGAGTTTGGCAAACCACTAGAATGCAGTGAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAACCATTATAA

HpaI (3313) MfeI (3324)

3300 GCTGCAATAAACAAGTTAAACAACAATTGCATTCATTTTATGTTTCAGGTTTCAGGGGGAGGTGTGGGAGGTTTTTAAAGCAAGTAAACCTCTACAA

EcoRI (3409)

3400 ATGTGGTATGGAATCTAAAATACAGCATAGCAAACTTTAACCTCCAATCAAGCCTCTACTTGAATCCTTTTCTGAGGGATGAATAAGGCATAGGCAT

3500 CAGGGCTGTTGCCAATGTGCATTAGCTGTTTGCAGCCTCACCTCTTTCATGGAGTTAAGATATAGTGATTTTCCCAAGTTTGAAGCTAGCTCTTCA

Swal (3662)

3600 TTTCTTTATGTTTTAAATGCACTGACCTCCACATTCCCTTTTTAGTAAAATATTCAGAAATAATTTAAATACATCATTGCAATGAAAATAAATGTTTTT

3700 TATTAGGCAGAATCCAGATGCTCAAGGCCCTTCATAATATCCCCAGTTTAGTAGTTGGACTTAGGGAACAAAGAACCTTTAATAGAAATTGGACAGCA

3800 AGAAAGCGAGCTTCTAGCTTTAGTTCTGGTGTACTTGGGGGATGAGTTCCTCAATGGTGGTTTTGACCAGCTTGCATTCTCAATGAGCACAAA  
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

SacI (3923)

3900 GCAGTCAGGAGCATAGTCAGAGATGAGCTCTCTGCACATGCCACAGGGGCTGACCACCCTGATGGATCTGTCCACCTCATCAGAGTAGGGGTGCCTGACA  
114▶ 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 R V

StuI (4087)

4000 GCCACAATGGTGTCAAAGTCTTCTGCCGTTGCTCACAGCAGACCAATGGCAATGGCTTCAGCACAGACAGTGACCCTGCCAATGTAGGCCTCAATGT  
80▶ 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 I H

4100 GGACAGCAGAGATGATCTCCCCAGTCTGGTCTGATGGCCGCCCGACATGGTGTCTTGTCTCATAGAGCATGGTATCTTCTCAGTGGCGACCTC  
47▶ 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 V E

BspHI (4237)

4200 CACCAGCTCCAGATCCTGCTGAGAGATGTTGAAGTCTTTCATGATGGCCCTCCTATAGTGAGTCGTATTATACATATGCCGATATACTATGCCGATGATTA  
14▶ V L E L D Q Q S I N F T K M

XmnI (4229) AseI (4295)

4300 ATTGTCAAACAGCGTGGATGGCGTCTCCAGCTTATCTGACGGTTCACTAAACGAGCTCTGCTTATATAGACCTCCACCGTACACGCCTACCGCCAT

SacI (4352)

4399 TTGCGTCAATGGGGCGGAGTTGTTACGACATTTTGAAAGTCCCGTTGATTTACTAGTCAAACAAACTCCCATTGACGTCAATGGGGTGGAGACTTGG

SpeI (4450)

4498 AAATCCCCGTGAGTCAAACCGCTATCCACGCCATTGATGTACTGCCAAAACCGCATCATCATGGTAATAGCGATGACTAATACGTAGATGTACTGCCAA

SnaBI (4578)

4598 GTAGGAAAGTCCCATAAGGTCATGTACTGGCATAATGCCAGGCGGGCCATTTACCGTATTGACGTCAATAGGGGGCTACTTGGCATATGATACACTT

NdeI (4683)

4698 GATGTACTGCCAAGTGGGAGTTTACCGTAAATACTCCACCCATTGACGTCAATGAAAGTCCCTATTGGCGTACTATGGAAACATACGTCAATTATTGA

PstI (4862)

4798 CGTCAATGGGCGGGGCTGTTGGGCGGTGAGCCAGGCGGGCCATTTACCGTAAGTTATGTAACGCTG C A 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  
SdaI (4861) PacI (4869)

4896 CCAGCAAAGGCCAGGAACCGTAAAAAGCCGCGTGTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAATCGACGCTCAAGTCAG

4996 AGGTGGCGAAACCCGACAGGACTATAAAGATACAGGCGTTTTCCCTGGAAGCTCCCTGTCGCTCTCTGTTCCGACCCTGCCGTTACCGGATACC

ApaI (5193)

5096 TGTCGCCCTTTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTGCTTCGCTCCAAGCTGGGCTGTGT

5196 GCACGAACCCCCGTTGAGCCGACCGCTGCGCCTTATCCGTAATATCGTCTTGTAGTCCAACCCGGTAAGACAGACTTATCGCCACTGGCAGCAGCC

5296 ACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGAAGCAGTATTGGTA

5396 TCTGCGCTCTGCTGAAGCCAGTTACCTTCGAAAAAGAGTTGGTAGCTCTTGTACCGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTGTTGCAA

5496 GCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGAACGAAAACCTCACGTTAAGGGATT

EagI (5629)

5596 TTGGTCATGGCTAGTTAATTAACATTTAAATC AGCGGCCGCAATAAAATATCTTTATTTTTCATTACATCTGTGTGTTGGTTTTTTGTGTGAATCGTAAAC

PacI (5609) Swal (5618) NotI (5628)

5695 TAACATACGCTCTCCATCAAACAAAACGAAACAAAACAAACTAGCAAAATAGGCTGTCCCCAGTGCAAGTGCAGGTGCCAGAACATTTCTCTATCGAA