



**PvuI (7)**  
**SgfI (6)**  
 1 GGATCTGGGATCGCTCCGGTGCCCGTCAGTGGGCAGAGCGCACATCGCCACAGTCCCGGAGAAGTTGGGGGAGGGGTCGGCAATTGAACGGGTGCCTA  
 101 GAGAAAGTGGCGCGGGTAAACTGGAAAGTGTGCTGTACTGGTCCGCCTTTTTCCGAGGGTGGGGGAGAACCCTATATAAGTGCAGTAGTCGCC

---

**Psp1406I (203)** **Bsu36I (291)**  
 201 GTGAACGTTCTTTTTCGCAACGGGTTTGGCCGAGAACACAGCTGAAGCTTCAGAGGGCTCGCATCTCTCTTACGCGCCCGCCCTACCTGAGGCC  
 301 GCCATCCACGCGGGTTGAGTCGCGTTTCTGCCGCTCCCGCTGTGGTGCCTCCTGAAGCTCGTCCGCCGTCTAGGTAAGTTAAAGCTCAGGTCGAGACC

---

**NgoMIV (441)**  
 401 GGGCCTTTGTCCGGCGCTCCCTTGAGCGCTACCTAGACTCAGCCGGCTCTCCACGCTTTGCTGACCCCTGCTTCTCAACTCTACGCTTTTGTTCGTTT

---

**KasI (535)** **BspEI (558)** **HpaI (589)**  
 501 TCTGTTCTGCGCGTTACAGATCCAAGCTGTGACCGGCGCTACCTGAGATCACCGGCTCCGGACATCATGAAGTTATATGTGTTTCTGGTTAACACCGG  
1 M K L Y V F L V N T G

---

**SphI (654)**  
 601 AACACGCTGACATTTGACACTGAGCTAACTGTGCAAAGTGTGGTGTATCTTAAGCATGCCATCAAAGCAAATACAAGATTGCTATTAGCACCAGGTT  
 11 T T L T F D T E L T V Q T V A D L K H A I Q S K Y K I A I Q H Q V

---

**Eco47III (754)**  
 701 CTGGTGGTCAATGGAGGAGAATGCATGGCTGCAGATCGAAGAGTGTGACTTACAGCGCTGGGACGGACACAAATCCAATTTTTCTTTTAAATAAGAAA  
 45 L V V N G G E C M A A D R R V C T Y S A G T D T N P I F L F N K E  
 801 TGATCTTATGTACCGTGCACCTGCTATTCTAAAGCTACCTTTCAACAGAAAATGACATGGAAATAAAAGTTGAAGAGTCTTTATGATGCCTGCAGT  
 78 M I L C D R A P A I P K A T F S T E N D M E I K V E E S L M M P A V

---

**XmnI (994)**  
**BsaBI (991)**  
 901 TTTCCACACTGTTGTTCAAGGACACAGCTTGCAAGTGTATGACGTTGCCAAGAAGCTCTGCTCTTTCTGTGAAGGGCTTGCCATGATGAACAT  
 111 F H T V A S R T Q L A V E M Y D V A K K L C S F C E G L V H D E H  
 1001 CTTCAGCACAAGGCTGGGCTGCAATCATGGCAATCTGGAGGACTGTTCAAATTCATACCAAAAATCTTTTCAAGTTTGAAGTATTTATCTGATT  
 145 L Q H Q G W A A I M A N L E D C S N S Y Q K L L F K F E S I Y S D  
 1101 ATCTTCAATCCATAGAAGACATCAAGTAAAACCTACTCATTAGGAAGTGTGTTTCAAGTAAAGGCTGAGATGAAAAGATCTACTGAAITGGTGCTCTCTCT  
 178 Y L Q S I E D I K L K L T H L G T A V S V M A K I P L L E C L T R H  
 1201 TAGTTACAGGGAATGTTGGGAAGACCGGATCTTTGAATGAACATGAAGGCTCAGAGAAAGTGAAGATGAAAAGATCTACTGAAITGGTGCTCTCTCT  
 211 S Y R E C L G R P D S L N E H E G S E K A E M K R S T E L V L S P

---

**BstEII (1329)** **AgeI (1375)**  
 1301 GATATGCCTAGAACATCGAACACATCCTTGTAACCTCATTTCAAGTCAATGGAGCATGTAGCTCCAGATCCCACCGTACTGAACGTGGCAAAGAAC  
 245 D M P R T S N T S L V T S F H K S M E H V A P D P T G T E R G K E

---

**ScaI (1417)**  
 1401 TTAGGAATCTTGTCAAAGTACTGTCAGCAAGAAGAAGCTTCAAGTGGATGCTAAAGACAGTGTCTGCCTTTTTTAAATGTTTCTTTGTTAGACTGGAT  
 278 L R E S C Q S T V Q Q E E A S V D A K D S D L P F F N V S L L D W I

---

**BstXI (1517)**  
 1501 AAATGTTCAAGATAGACCAATGATGTGGAATCTCTGGTCAAGGAGTGTCTTGTATGATGAGCAGGCTTGACCCAAAGATTATTCAACCATTATGTTA  
 311 N V Q D R P N D V E S L V R K C F D S M S R L D P K I I Q P F M L

---

**NheI (1693)**  
 1601 GAATGCCATCAAATATTGCCAAACTTGATAATCAGAATATGAAAGCCATTAAGGGCTTGAAGATCGGCTGTATGCCTTGGACCAGATGATTGCTAGCT  
 345 E C H Q T I A K L D N Q N M K A I K G L E D R L Y A L D Q M I A S

---

**NgoMIV (1703)**  
 1701 GTAGCCGGCTGGTAAATGAACAGAAAGAGCTTGTCTCAGGATTTTTAGCTAATCAGATGAGAGCTGAAAACCTGAAGGATGCATCTGTGTTACCTGATCT  
 378 C S R L V N E Q K E L A Q G F L A N Q M R A E N L K D A S V L P D L

---

**NheI (1893)**  
 1801 GTGTCTGAGTCATGCAAATCAACTAATGATTATGTTGCAAACCACAGAAAACCTGTTGGATATTAACAGAAAGTGCACCACCTGCCAAACAAGACTAGCA  
 411 C L S H A N Q Q L M I M L Q N H R K L L D I K Q K C T T A K Q E L A  
 1901 AACAACTCCACGTCAGACTGAAGTGGTGTGTTTGTGATGCTCATGATGAGAGTGGAGAAAACCTGCCAGGCACTGCTCCGCCTGTAATAGAGC  
 445 N N L H V R L K W C C F V M L H A D Q D G E K L Q A L L R L V I E  
 2001 TGTTAGAAAAGAGTCAGAATTGTTGAGGCTTTAGTACAGTTCTCAGATGATTGCTAGCTGTTGTTGAGGTTGTAAGAAGAAAATGTTTCATTAACA  
 478 L L E R V R I V E A L S T V P Q M Y C L A V V E V V R R K M F I K H  
 2101 CTACAGAGAGTGGGCTGGTCTTGTAGTCAAAGACGAAAACAATATGAAGCTGAAAAGTCAAAGGAAATCCTTTGGGAAATTTATTAGGAAAGTCC  
 511 Y R E W A G A L V K D G K Q L Y E A E K S K R E S F G K L F R K S  
 2201 TTTTAAAGAAATCGTCTGTTTAAAGGACTGGACTCCTGGCCTTCTCATTTTGTACTCAGAAGCTCGAAAATTTGACTGTGAACCTCCAGATATATCGT  
 545 F L R N R L F K G L D S W P S S F C T Q K P R K F D C E L P D I S

---

**SandI (2357)** **Bsu36I (2352)**  
 2301 TAAAAGATTTACAGTTTCTTCAATCATTTTGTCTTCCAGAAAGTGCAGCCATTCCTCAGGGTCCCTTACTTTGTGACTTTGAACCTCTACACCAGCATGT  
 578 L K D L Q F L Q S F C P S E V Q P F L R V P L L C D F E P L H Q H V  
 2401 ACTTGCCCTACATAATTTGGTAAAAGCAGCACAAAGTTTGGATGAAATGTCACAGACTATTACAGATCTCCTAAATGAACAAAAGGTATCCACAAAGTCA  
 611 L A L H N L V K A A Q S L D E M S Q T I T D L L N E Q K V S T S Q  
 2501 GCATCCCCACAGTCAGTCTTCCAAAGATAGAAAAGTACAACAGGATTACACACTACCTCACCACAAAACCTCCTCCACTAAGTGTTCAGGACA  
 645 A S P Q Q S A A P R I E S T T G I T T T T S P K T P P C L T V Q D

---

**ClaI (2647)**  
 2601 CCTATGTCCGGCAGTGTGTCCCTTAGAAGAATATCTCCAGATAGTATCGATGCTCATACTATTGATTTIGAAACCATCTCCCATCCAAACACAGAACA  
 678 T L C P A V C P L E E L S P D S I D A H T F D F E T I S H P N T E Q  
 2701 ACCTGTTCAACAAGCTTCTATAGACTTGGATTCTAGCAGAAAAGCCCTGAGCTGACTTTATGTCTGTGTAATGAGTTTGTGATAGAAGAAAATTTA  
 711 P V H Q A S I D L D S L A E S P E S D F M S A V N E F V I E E N L

2801 TCGTCTCCAAACCTATAAGTGATCCACAAAGTCCAGAAATGATGGTGGAGTCACTTTACTCTTCAGTCATCAATGCAATAGATAGTAGGCGTATGCAAG  
745▶ S S P N P I S D P Q S P E M M V E S L Y S S V I N A I D S R R M Q  
BbrPI (2909) EcoRI (2996)  
2901 ACACAAGTACACGTGGAACCGAGGGCTTTGGGGATCGGGCTGCTCTACATGTCCAGCTGGAGAAATGCAGAGCTGCTGCAACAAGACTCTCACAGCATAT  
778▶ D T S T R G N E G F G D R A A L H V Q L E K C R A A A Q D S H S S I  
3001 ACAAACCATCAAGGACGATCTGTGCCATTTAGAACATTTGTACAAAAAGAACAGTGTGACTTAGCAAATTTAAAAATGTACAGCTGTAGAAATAAGA  
811▶ Q T I K D D L C H F R T F V Q K E Q C D L A N Y L K C T A V E I R  
SspI (3100) XbaI (3126)  
3101 AATATTATTGAAAAAGTAAAATGTTCTCTAGAAAAAACAATAAAGGAAAAAGCATCAGCAAGAAGTCCAAATCTTTAAAAATTTAGTATGAATGTAAGTCTG  
845▶ N I I E K V K C S L E I T L K E K H Q Q E L Q S L K I E Y E C K L  
EcoRI (3298)  
3201 ATGCTCTAGTAAAAGACAGTGAAGAAAATGTAATAAAAATTTTAAAAATTGAAAGAAAATTTAGTATCCCTTGAAGAGGCTTTACAAAATAAAGACAATGA  
878▶ D A L V K D S E E N V N K I L K L K E N L V S L E E A L Q N K D N E  
3301 ATTCACCTCGATTAAACATGAAAAGGATGCTATTGTCTGTGTGCGCAAGAAAAGGATCAGAAAGTTGTTAGAGATGAAAAGATAATGCATACTCAACAT  
911▶ F T S I K H E K D A I V C V Q Q E K D Q K L L E M E K I M H T Q H  
3401 TGTGAAATTAAGAACTGAAGCAGTCACGAGAGATGGCATTAGAAAGACCTGAAAAAGCTGCATGATGAAAAATCAGATCATTGAGAGCTGAATTTTCAGT  
945▶ C E I K E L K Q S R E M A L E D L K K L H D E K I E S L R A E F Q  
3501 GCTTAGAACAAAATCACCTGAAGGAATTAGAGGACACTGCACATCAGGCACACAGAGTTTGAGAAAAGTTATGACAGACCAATATGTCTTTTGA  
978▶ C L E Q N H L K E L E D T L H I R H T Q E F E K V M T D H N M S L E  
3601 GAAATTAAGAAAAGAAAATCAGCAAGAAGTACCAGATGCTAGAATCTCATGCCTCAACTATTCAGGAAAAAGAGCAACAGCTGCAGGAGTTGAAACTC  
1011▶ K L K K E N Q Q R I D Q M L E S H A S T I Q E K E Q Q L Q E L K L  
BsaBI (3774)  
3701 AAAGTTTCTGACTTGTGAGATGTAAGTTAGAGGTTGAACTTGCCTAAAGGAGCAGAAAACAGATGAGATAAAGATCTTTGTTGAAGAGAGCA  
1045▶ K V S D L S D M R C K L E V E L A L K E A E T D E I K I L L E E S  
3801 GAACACAGCAGAAGGAAATGCTGAAGTCTTTACTTGAACAAGAGACCGAAAACCTTAAAGACAGAAATAAGTAAACTAAACAAAAAATTCATGATAATAA  
1078▶ R T Q Q K E M L K S L L E Q E T E N L R T E I S K L N Q K I H D N N  
3901 TGAGAGTTACCAGTGGGTTTGTGAGAGCTTAAAGACTTAAAGACAATTGAAAAGATCAGTGCATTTTCAGAGTTAATCAGTAGACATGAAGAAGAAATC  
1111▶ E S Y Q V G L S E L R A L M T I E K D Q C I S E L I S R H E E E S  
4001 AATATACTTAAGGCTGAATTAGACAATGTTACATCTTTGCATCGCAAGCATTTGAAATAGAAAAAAACTGAAAAGAACAATAGTTGAATTGCAGACTA  
1145▶ N I L K A E L D N V T S L H R Q A F E I E K K L K E Q I V E L Q T  
4101 GATTGAACTCAGAATTGAGTGCTTGAAAAACAGAAAGATGAAAAAATAACCAACAAGAAGAGAAGTATGAAGCAGTATCCAGAACCTTGAGAAAGA  
1178▶ R L N S E L S A L E K Q K D E K I T Q Q E E K Y E A R I Q N L E K D  
4201 CAAGGAGAGACTGGTCAAGAACCACGAGCAAGAACAAAGAACACTTAATTTCAGGAGCTTAAATTTGAAAAAAAACAAAGCTGTTCAAQCTCACTAGATGAA  
1211▶ K E R L V K N H E Q D K E H L I Q E L N F E K N K A V Q T A L D E  
4301 TTTAAGGTGGAGAGAGAAGTGTGAGAAAAGATTATTAGAAAAAGTTAAACATCTTGAGAATCAAATAGCCAAAACCTCTGCCTTTGAGTCAGCCAGAG  
1245▶ F K V E R E L V E K E L L E K V K H L E N Q I A K T P A F E S A R  
4401 AAGATCTTCAAGCTTAGTTGCGGAAGTCAAGAGAAAGTCAAGAGAAAAGTCAAGTAAAGTCTTGAACAAGTGAAGAACAAGAGAAAAGAAAGAAATGA  
1278▶ E D S S S L V A E L Q E K L Q E E K A K F L E Q L E Q E K R K N E  
4501 GGAATGCAAAATGTCAGAACCTCTTTGATTGCTGAGCAGCAGACCAACTTTAACACAGTCTTAAACAAGAGAGAAAATGAGGAAAAGAAAACATAATAAT  
1311▶ E M Q N V R T S L I A E Q Q T N F N T V L T R E K M R K E N I I N  
BsrBI (4639)  
4601 GATCTTAGTGATAAGCTAAAAAGTACAATGCAGCAGCAAGAGCGGGATAAAGATTTGATAGAGTCGCTCTCTGAGGACCGAGCTCGTTTGCTTGAAGAGA  
1345▶ D L S D K L K S T M Q Q Q E R D K D L I E S L S E D R A R L L E E  
4701 AGAAGCAGCTTGAAGAGGAAGTGAAGTAACTCCGCACTAGCAGTCTTTCTTCTCAGCACCTGTGGCTGCAGCCCCAGAGCTCTATGGTGCCTGTGCACC  
1378▶ K K Q L E E E V S K L R T S S F L S S A P V A A A P E L Y G A C A P  
4801 TGAGCTCCAGGGGAGCCAGAGAGATCAGTCATGGAGCAGCAGATGAAGGAAGACTGGATTCCGCAATGGAGACAAGCATGATGCTGTCCAAGAAAAC  
1411▶ E L P G E P E R S V M E T A D E G R L D S A M E T S M M S V Q E N  
PshAI (4985)  
4901 ATGTTATCTGAAGAGAAGCAGAGGATCATGCTCCTAGAACGGACATTGCAGTTGAAAGAAGAAGAAAACAAGCGGTTAAATCAAAGACTGATGCTCAGA  
1445▶ M L S E E K Q R I M L L E R T L Q L K E E E N K R L N Q R L M S Q  
BsrBI (5086)  
5001 GTTTGCTCAGTCTCTTCAAGGCACTTGAAGAAAATAGCCATTAGAGATTTTTCAGGTGGGAGATTTGGTTCTCATCCTAGATGAGCGGCACAGCAA  
1478▶ S L S S V S S R H S E K I A I R D F Q V G D L V L I I L D E R H D N  
XbaI (5197)  
5101 TTATGTATTGTTTACTGTTAGTCTACTTTATATTTTCTGCACTCAGAGTCTCTTCTGCTCCGATCTCAAACAGGTGAGGGAGCTTCAGGTGCATCT  
1511▶ Y V L F T V S P T L Y F L H S E S L P A L D L K P G E G A S G A S  
5201 AGAAGACCTGGTCTTGGGAAAAGTAATGAAAAGGAATACTGTCAAGCAAAAGGACAAAACAGATTTAAAGTTCTTTGGGACAAAAGTTTACA  
1545▶ R R P W V L G K V M E K E Y C Q A K K A Q N R F K V P L G T K F Y  
AvrII (5355)  
5301 GAGTGAAGCTGTGTCATGGAATAAGAAAGTATAGCCACAGAAGAAATCTCTACACCTAGGACTAGCTGGCCAGACATGATAAGATACATTGATGAGTTT  
1578▶ R V K A V S W N K K V •  
HpaI (5499)  
5401 GGACAACCACAAGTGAATGCAGTGAAGAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAACAAG  
EcoRI (5595)  
5501 TTAACAACAACAATTGCATTCAATTTATGTTTCAGGTTTCAGGGGAGGTGTGGGAGGTTTTTTAAAGCAAGTAAAACCTTACAAATGTGGTATGGAATT  
5601 CTAAAATACAGCATAGCAAACTTTAACCTCCAATCAAGCCTTACTTGAATCCTTTTCTGAGGGATGAATAAGGCATAGGCATCAGGGCTGTTGCCA  
5701 ATGTGCATTAGTGTGTCAGCCTCACCTTCTTTCATGGAGTTAAGATATAGTGTATTTTCCAAGGTTTGAAGTACTCTTCAATTTCTTATGTTTTA  
SspI (5834) SmaI (5848)  
5801 AATGCACTGACCTCCACATTCCCTTTTTAGTAAAATATTGAGAAAATAATTTAAATACATCATTGCAATGAAAATAAATGTTTTTTATTAGGCAGAATCC

5901 AGATGCTCAAGGCCCTTCATAATATCCCCAGTTTAGTAGTTGGACTTAGGGAACAAAGGAACCTTTAATAGAAATTGGACAGCAAGAAAGCGAGCTTCT

---

6001 AGCTTTAGTTCCTGGTGTACTTGAGGGGATGAGTTCTCAATGGTGGTTTTGACCAGCTTGCCATTCATCTCAATGAGCACAAAGCAGTCAGGAGCATA  
 141 • N R T Y K L P I L E I T T K V L K G N M E I L V F C D P A Y

BstXI (6138)

6101 GTCAGAGATGAGCTCTCTGCACATGCCACAGGGGTGACCACCTGATGGATCTGTCCACCTCATCAGAGTAGGGGTGCTGACAGCCACAATGGTGCA  
 109 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 A V I T D

StuI (6273)

6201 AAGTCCTTCTGCCGTTGCTCACAGCAGACCCAATGGCAATGGCTTCAGCACAGACAGTGACCCTGCCAATGTAGGCCTCAATGTGGACAGCAGAGATGA  
 75 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 V A S I I

6301 TCTCCCCAGTCTTGGTCCGTATGGCCGCCCGACATGGTGCTTGTCTCATAGAGCATGGTGATCTTCTCAGTGGCGACCTCCACCAGCTCCAGATC  
 42 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 V L E L D

XmnI (6415) AseI (6481)

6401 CTGCTGAGAGATGTTGAAGGTCTTCATGATGGCCCTCTATAGTGAGTCGATTATATACTATGCCGATATACTATGCCGATGATTAATTGTCAAACAGCGG  
 9 Q Q S I N F T K M

6501 TGGATGGCGTCTCCAGCTTATCTGACGGTTCACTAAACGAGCTCTGCTTATATAGACCTCCACCGTACACGCCTACCGCCATTTGCGTCAATGGGGCG

---

SpeI (6636)

6601 GAGTTGTTACGACATTTTGGAAAGTCCCCTTGATTTACTAGTCAAAAACAACTCCCATTGACGTCAATGGGGTGGAGACTTGGAAATCCCCGTGAGTCA

---

SnaBI (6764)

6700 AACCGCTATCCACGCCATTGATGTACTGCCAAAACCGCATCATCATGGTAATAGCGATGACTAATACGTAGATGTACTGCCAAGTAGGAAAGTCCATA

---

NdeI (6869)

6800 AGGTCATGTACTGGGCATAATGCCAGGCGGGCCATTTACCGTCATTGACGTCAATAGGGGGCGTACTTGGCATATGATACACTTGATGTACTGCCAAGTG

6900 GGCAGTTTACCGTAAATACTCCACCCATTGACGTCAATGGAAAGTCCCTATTGGCGTTACTATGGGAACATACGTCAATTATTGACGTCAATGGGCGGGGG

---

SdaI (7047) PacI (7055)

7000 TCGTTGGGCGGTGAGCCAGGCGGGCCATTTACCGTAAGTTATGTAACGCTG C A G G T T A A T T A A G A C A T G T G A G C A A A A G G C C A G C A A A A G G C C A G G

7098 AACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGA

---

7198 CAGGACTATAAGATACCAGGCGTTTTCCCTGGAAGCTCCCTCGTGGCTCTCTGTTCCGACCTGCGGCTTACCGGATACCTGTCCGCTTTCTCCC

---

7298 TTCGGGAAGCGTGGCGCTTTCTCATAGCTACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCCGCTCAAGCTGGGCTGTGTGCAGAACCCCCGTT

---

7398 CAGCCGACCGCTGCGCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTA

---

7498 GCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTCTTGAAGTGGTGGCCCTAACTACGGCTACACTAGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAA

---

7598 GCCAGTTACCTTCGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGTTTTTTTGTTCGAAAGCAGCAGATTACGGCG

---

PacI (7795)

7698 AGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAAACGAAAACCTCACGTTAAGGGATTTTGGTCATGGCTAGTT

---

EagI (7815)

Swal (7804) NotI (7814)

7798 AATTAACATTTAAATC AGCGGCCGCAATAAAATATCTTTATTTTTCATTACATCTGTGTGTTGGTTTTTGTGTGAATCGTAACTAACATACGCTCTCCAT

7898 CAAAACAAAACGAAACAAAACAACTAGCAAAATAGGCTGTCCCAGTGCAAGTGCAGGTGCCAGAACATTTCTATCGAA