



**PvuI (7)**  
**SgfI (6)** 1 GGATCTGCGATCGCTCCGGTGCCCGTCAGTGGGAGAGCGCACATCGCCACAGTCCCGGAGAAGTTGGGGGAGGGGTGGCAATTGAACGGGTGCCTA  
MfeI (82) EcoNI (96)

101 GAGAAGGTGGCGCGGGTAAACTGGAAAGTGATGTCGTGACTGGCTCCGCCTTTTTCCGAGGGTGGGGGAGAACCCTATATAAGTGCAGTAGTCGCC

**Bsu36I (291)**  
Psp1406I (203) HindIII (245) EcoNI (287)  
201 GTGAACGTTCTTTTTCGCAACGGGTTTGGCCGAGAACACAGCTGAAGCTTCGAGGGGCTCGCATCTCTCTTACAGCGCCCGCCGCTACCTGAGGCC  
301 GCCATCCACGCGGTTGAGTCGCGTTTCTGCCGCTCCCGCCTGTGGTGCTCTGAACTGCGTCCGCCGTCTAGGTAAGTTTAAAGCTCAGGTCGAGACC

**NgoMIV (441)**  
401 GGGCCTTTGTCCGGCGCTCCCTTGAGCCTACCTAGACTCAGCCGGCTCTCCACGCTTTGCTGACCCTGCTTGTCTAACTCTACGTCTTTGTTTCGTTT

**AgeI (552)**  
501 TCTGTTCTGCGCCGTTACAGATCCAAGCTGTGACCGGCGCCTACCTGAGATCACCGGTCAICATGGCATGTCAACTTGACTTGCTCATAGGTGTGATCTT  
XcmI (605) BamHI (689)  
601 CATGGCCAGCCCCGTGTTGGTAATATCTCCCTGTTCTTCAGACGGCAGGATAGCCTTTTTCCGAGGCTGTAACCTCACCCAGATTCCCTGGATCCTCAAT  
130 M A S P V L V I S P C S S D G R I A F F R G C N L T Q I P W I L N

**SandI (796)**  
701 ACTACCACTGAGAGGCTCCTGCTCAGTTCACATATATCAGTATGGTGGTTGCCACATCATTTCCACTCCTGGAGCAAGCTCCAGTTGCTGGAGCTGGGA  
47 T T T E R L L L S F N Y I S M V V A T S F P L L E Q L Q L L E L G  
80 CCCAGTATGCTAACTTGACCATTTGGTCCAGGGGCTTTCAGAACTGCCAATCTTAGGATCTTGACTTGGGCCAAAGCCAGATCGAAGTCTTGAATCG  
80 T Q Y A N L T I G P G A F R N L P N L R I L D L G Q S Q I E V L N R  
901 AGATGCCTTTCAAGGTCTGCCCATCTCTTGAAGTTCGGCTGTTTTCTGTGGACTCTCCAGTCTGTGTTAAGTGACGGTTACTTCAGAAATCTATAT  
113 D A F Q G L P H L L E L R L F S C G L S S A V L S D G Y F R N L Y

**EcoRI (1071)**  
1001 TCATTAGCTCGTTAGACCTATCTGGCAACCAGATTACAGCCTCCGCTCATTCTTATTCCGGAACTGAATTCCTTAAGCGACGTAATTTTTGCTT  
147 S L A R L D L S G N Q I H S L R L H S S F R E L N S L S D V N F A

**SspI (1107)** **XhoI (1132)**  
1101 TCAACCAATATTCACTATATGTGAAGATGAACTCGAGCCTCTCGAGGGCAAAACACTGTCTTTCTTTGGCCTCAAATTAAGCTGTTCCAGCAGAGT  
180 F N Q I F T I C E D E L E P L Q G K T L S F F G L K L T K L F S R V

**BglII (1257)**  
1201 CTCTGTGGGCTGGGAGACATGCAGGAACCCCTTCAGAGGGCTGAGGCTAGAACTCTAGATCTTTCTGAAAATGGCTGGACGGTGACATCACAGGAAC  
213 S V G W E T C R N P F R G V R L E T L D L S E N G W T V D I T R N  
1301 TTCAGCAACATCCAGGGAAGCCAGATTTCTTCTTAAACACACATCATGGGCTGGCTTGGCTTCCAGAACATCAGAGATCCTGACC  
247 F S N I I Q G S Q I S S L I L K H H I M G P G F G F Q N I R D P D  
1401 AGAGCACATTTGCCAGCCTGGCCAGAAGTTCGGTGTGCAACTGGACCTTTCGCACGGCTTTATCTTCTCCTTGAATCTCGACTGTTGGGACACTGAA  
280 Q S T F A S L A R S S V L Q L D L S H G F I F S L N P R L F G T L K  
1501 GGATTTGAAGATGCTGAACCTTGCCCTCAACAAGATAAACAAGATTGGAGAGAATGCCTTTTATGGGCTTGACAGCCTCCAGGTTCTCAATCTATCCTAT  
313 D L K M L N L A F N K I N K I G E N A F Y G L D S L Q V V L N L S Y  
1601 AATCTTTGGGGAACCTATAATTCCAATTTCTAGGCTTCTAGAGTAGCTACGTTGACCTTCAAAGGAACACATTGGGATCATTTCAAGACAAA  
347 N L L G E L Y N S N F Y G L P R V A Y V D L Q R N H I G I I Q D Q

**Psp1406I (1716)** **BglII (1731)**  
1701 CATTAGATTATTAACAAACGTTACAAACCTTAGATCTCCGTGACAATGCTCTTAAGGCCATTGGTTTTATTCCAAGCATAACAGATGGTCCCTCCTGGGAGG  
380 T F R L L K T L Q T L D L R D N A L K A I G F I P S I Q M V L L G G  
1801 CAATAAGCTGGTCCATTTGCCACACATCCACTTTACTGCCAATCTCCTAGAGTTATCTGAAAACAGGCTAGAAAACCTGTCCGACCTCTACTTCCCTCGT  
413 N K L V H L P H I H F T A N F L E L S E N R L E N L S D L Y F L L

**HindIII (1983)**  
1901 CGAGTCCCCAGCTCCAGTTTCTCATCTTGAATCAGAATCGCTTTCTGTCATGCAAGGCAGCCACACTCCCTCGGAGAACCAAGCTTAGAACAGCTTT  
447 R V P Q L Q F L I L N Q N R L S S C K A A H T P S E N P S L E Q L  
2001 TCCTTACAGAGAATATGCTGCAGCTGGCCTGGGAGACCGGCTCTGTTGGGATGTTTTCAAGGCCTTTCCCGCTCCAGATTCTTACCTGAGTAATAA  
480 F L T E N M L Q L A W E T G L C W D V F Q G L S R L Q I L Y L S N N  
2101 CTACCTTAATTTCTCCACCTGGGATATTTAACGACCTGGTTGCATTACGGATGCTTAGTCTTAGTGCTAACAGCTGACCGTCTCTCCGGGAGT  
513 Y L N F L P P G I F N D L V A L R M L S L S A N K L T V L S P G S

**XbaI (2230)**  
2201 TTACTGTAATTTAGAGATTCTCGACATATCTAGAAATCAGCTTTTCTCTCCTGACCCTGCTTTGTTTTCTCGCTTCGTGTTTTGGACATAACTCATA  
547 L P A N L E I L D I S R N Q L F S P D P A L F S S L R V L D I T H  
2301 ACGAGTTCGTCTGCAACTGTGAACCTTAGCACTTTATCTCCTGGCTCAACCAAAACCAAGTCAACCCTGTTCCGGCTCTCTGCAGACGTGATTGCATGTA  
580 N E F V C N C E L S T F I S W L N Q T N V T L F G S P A D V Y C M Y

**ApaLI (2499)**  
2401 CCCTAACTACTGCTAGGGGCTCCCTCTACAACATATCCACCGAAGACTGCGATGAAGAGGAAGCCATGCGGTCCTAAAGTTTTCCCTTTTCATCTG  
613 P N S L L G G S L Y N I S T E D C D E E E A M R S L K F S L F I L

**XcmI (2582)**  
2501 TGCACGGTCACTTTGACTCTATTCTCGTCATACCCTTGTAGTCATAAAGTTCCGGGAATCTGTTTCTGTGCTATAAGACCATCCAGAAGCTGGTGT  
647 C T V T L T L F L V I T L V V I K F R G I C F L C Y K T I Q K L V

**Tth111I (2605)** **BstAPI (2683)**  
2601 TCAAGGACAAGGCTGGAGTTTGAACCTGGTGCATATAGATATGATGCCTACTTCTGCTTCAGCAGCAAAAGACTTTGAATGGGCACAGAATGCTTTGCT  
680 F K D K V S L E P G A Y R Y D A Y F C F S S K D F E W A Q N A L L  
2701 CAAACCTGGATGCTCACTACAGTTCCCGAAACAGGCTCAGGCTATGCTTTGAAGAAAGAGACTTCATTCCAGGGGAAAACCATCTCCAACATCCAG  
713 K H L D A H Y S S R N R L R L C F E E R D F I P G E N H I S N I Q

2801 GCGGCTGTCTGGGGCAGCAGGAAGACGGTGTGTCTAGTGAGCAGACACTTCTGAAGGATGGTGGTGCCTGGAGGCCTTCAGGTATGCCAGAGCCGGA  
 747▶ A A V W G S R K T V C L V S R H F L K D G W C L E A F R Y A Q S R  
 2901 GTCTGTCTGATCTCAAGACATTCTCATCGTGGTGGTGGGATCGCTGTCCAGTATCAGCTGATGAGACATGAGACCATCAGAGGTTTCTGCAAAA  
 780▶ S L S D L K S I L I V V V V G S L S Q Y Q L M R H E T I R G F L Q K

**ScaI (3005)** **BstXI (3030)** **NsiI (3066)**  
**BspEI (3061)**  
 3001 GCAACAGTACTTGGAGGTGGCCTGAAGACCTCCAGGATGTTGGCTGTTTCTCGATAAACTCTCCGGATGCATTCTAAAGGAAGAAAAAGCAAAGAAAAGA  
 813▶ Q Q Y L R W P E D L Q D V G W F L D K L S G C I L K E E K A K K R  
**NheI (3176)**  
 3101 AGCAGTTCATCCAGTTGCGAACCATAGCAACCATTTCTAGCAGGAGCGCCTCTAGCAGAAGTGAAGCATCGTCTAGCTGGCCAGACATGATAAGA  
 847▶ S S S I Q L R T I A T I S •  
 3201 TACATTGATGAGTTTGGACAAACCACAACCTAGAATGCAGTGAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAACCATTATAA

**HpaI (3314)** **MfeI (3325)**  
 3301 GCTGCAATAAACAAAGTTAAACAACAACAATTGCATTCATTTTATGTTTCAGGTTTCAGGGGAGGTGTGGGAGGTTTTTAAAGCAAGTAAACCTCTACAA

**EcoRI (3410)**  
 3401 ATGTGGTATGGAATTCTAAAATACAGCATAGCAAACTTTAACCTCCAATCAAGCCTCTACTGAATCCTTTTCTGAGGGATGAATAAGGCATAGGCAT

**SapI (3592)**  
 3501 CAGGGCTGTTGCCAATGTGCATTAGCTGTTTGCAGCCTCACCTCTTTTCATGGAGTTTAAAGATATAGTGATTTTTCCCAAGTTTGAAGTACTCTTCA

**SspI (3649)** **Swal (3663)**  
 3601 TTTCTTTATGTTTTAAATGCACTGACCTCCACATTCCCTTTTTAGTAAAATATTCAGAAATAATTTAAATACATCATTGCAATGAAAATAAATGTTTTT  
 3701 TATTAGGCAGAATCCAGATGCTCAAGGCCCTTCATAATATCCCCAGTTTAGTAGTTGGACTTAGGGAACAAAGAACCTTTAATAGAAATTGGACAGCA  
 3801 AGAAAGCGAGCTTCTAGCTTTGATGTTCTGGTACTTGGGGGATGAGTTCCTCAATGGTGGTTTTGACCAGCTTGCCATTCATCTCAATGAGCACAAA  
 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 (3924)** **BstXI (3953)**  
 3901 GCAGTCAGGAGCATAGTCAGAGATGAGCTCTGACATGCCACAGGGGTGACCACCCTGATGGATCTGTCCACCTCATCAGAGTAGGGGTGCCTGACA  
 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  
 4001 GCCACAATGGTGTCAAAGTCTTCTGCCGTTGCTCACAGCAGACCAATGGCAATGGCTTCAGCACAGACAGTGACCCTGCCAATGTAGGCCCTCAATGT  
 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  
 4101 GGACAGCAGAGATGATCTCCAGTCTTGGTCTGATGGCCGCCCGACATGGTGCTTGTCTCTATAGAGCATGGTGATCTTCTCAGTGGCGACCTC  
 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 (4238)** **AseI (4296)**  
 4201 CACCAGTCCAGATCCTGCTGAGAGATGTTGAAGTCTTCATGATGGCCCTCTATAGTGAGTCGTATTATACTATGCCGATATACTATGCCGATGATTA  
 14▶ V L E L D Q Q S I N F T K M

**SacI (4353)**  
 4301 ATTGTCAAACAGCGTGGATGGCGTCTCCAGCTTATCTGACGGTTCATAAACGAGCTCTGCTTATATAGACCTCCACCGTACACGCCCTACCGCCATT

**SpeI (4451)**  
 4401 TGGCTCAATGGGGCGGAGTTGTTACGACATTTTGAAAGTCCCGTTGATTTACTAGTCAAACAAACTCCATTGACGTCAATGGGGTGGAGACTTGAA

**SnaBI (4579)**  
 4501 ATCCCCGTGAGTCAAACCGCTATCCACGCCATTGATGTAAGTCCAAAACCGCATCATCATGGTAATAGCGATGACTAATACGTAGATGTAAGTCCCAAGT

**NdeI (4684)**  
 4601 AGGAAAGTCCCATAAAGTTCATGTAAGTGGCATAATGCCAGGCGGGCCATTTACCGTCAATGAGGGGCGTACTTGGCATATGATACTACTTGA  
 4701 TGTAAGTCCCAAGTGGGAGTTTACCGTAAATACTCCACCCATTGACGTCAATGAAAGTCCCTATTGGCGTACTATGGGAACATACGTCAATTATTGACG

**PacI (4870)** **SdaI (4862)** **BspLU11I (4880)**  
 4801 TCAATGGGCGGGGTCGTTGGGCGTCCAGCCAGGCGGGCCATTTACCGTAAAGTATGTAACCGCTGCAGGTTAATTAAGAACATGTGAGCAAAAGGCCAG  
 4901 CAAAAGGCCAGGAACCGTAAAAGGCCGCTTGTGCGGTTTTTCCATAGGCTCCGCCCTGACGAGCATCAGAAAATCGACGCTCAAGTCAAGGTT  
 5001 GCGGAAACCCGACAGGACTATAAAGATACCAGGCTTTCCCTCGTGGAGCTCCCTCGTGGCTCTCTGTTCCGACCTGCCGTTACCGGATACCTGTC

**ApaLI (5194)**  
 5101 CGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGATAGTATCTCAGTTCGGTGTAGGTCGTTCCGCTCAAGCTGGGCTGTGTGCAC  
 5201 GAACCCCGTTTCAGCCGACCGCTGCGCTTATCCGGTAACTATCGTCTTGAAGTCCAAACCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTG  
 5301 GTAACAGGATTAGCAGAGCGAGGTATGTAGCGGTGCTACAGATTTCTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGAACAGTATTTGGTATCTG  
 5401 CGCTCTGCTGAAGCCAGTTACCTTCGAAAAAGAGTTGGTAGCTCTTATCGGCAAAACAAACCCGCTGGTAGCGGTGTTTTTTTGTGCAAGCAG  
 5501 CAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTCTACGGGCTGACGCTCAGTGAACGAAAACCTCACGTTAAGGGATTTTGG

**EagI (5630)**  
**PacI (5610)** **Swal (5619)** **NotI (5629)**  
 5601 TCATGGCTAGTTAATTAACATTTAAATC AGCGGCCGAATAAAAATATCTTTATTTTATTACATCTGTGTGGTTTTTTGTGTAATCGTAACCTAACA  
 5701 TACGCTCTCCATCAAACAAAACGAAACAAAACAAACTAGCAAAATAGGCTGTCCCAGTGCAAGTGCAGGTGCCAGAACATTTCTCTATCGAA