



**PvuI (7)**  
**SgfI (6)**  
1 GGATCTGCGATCGCTCCGGTGCCCGTCAGTGGGCAGAGCGCACATCGCCACAGTCCCCGAGAAGTTGGGGGAGGGGTCGGCAATTGAACGGGTGCCTA

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101 GAGAAGGTGGCGCGGGTAAACTGGGAAAGTATGTCGTGTACTGGCTCCGCCCTTTTCCCGAGGGTGGGGGAGAACCCTATATAAGTGCAGTAGTCGCC

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**HindIII (245)**  
**Psp1406I (203)** **PvuII (239)** **Bsu36I (291)**  
201 GTGAACGTTCTTTTTCGCAACGGGTTTGCCGCCAGAACACAGCTGAAGCTTCGAGGGGCTCGCATCTCTCTTACCGCGCCCGCCCTACCTGAGGGC

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301 GCCATCCACGCCGGTTGAGTCGCGTCTCGCCGCTCCCGCTGTGGTGCTCTGAACTGCGTCCGCGCTAGGTAAGTTTAAAGCTCAGGTCGAGACC

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**NgoMI (441)**  
**NaeI (441)**  
401 GGGCCTTTGTCCGGCGCTCCCTTGAGGCTACCTAGACTCAGCCGGCTCTCCACGCTTTGCTGACCTGCTTGTCAACTCTACGCTTTTGTTCGTT

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**SphI (560)**  
**AgeI (552)**  
501 TCTGTTCTGCGCGTTACAGATCCAAGCTGTGACCGGCGCTACCTGAGATCACCGGTACGATGCAGAGCACCTCCAACCATCTGTGGCTCCTGTCTGA

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**AvrII (603)** **HindIII (690)**  
601 TATCCTAGGCCAGGGGGCCACTGCAATGTCTTCCGAGGAAGGCATAAGAAAATGGTGATCTCTATGCTGTCAAAGTATTTAATAACATAAGCTTCTT  
13▶ I L G Q G A T A N V F R G R H K K T G D L Y A V K V F N N I S F L  
701 CGCCAGTGGATGTTCAAATGAGAGAATTTGAAGTGTAAAAAACTCAATCACAAAACATTGTCAAGTATTGCTATTGAAGAGGAGACAACAACA  
47▶ R P V D V Q M R E F E V L K K L N H K N I V K L F A I E E E T T T

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**XbaI (852)**  
801 GACATAAAGTCTTATTATGGAGTTTTGTCCCTGTGGGAGTTTATACACTGTTCTAGAGGAGCCGTCATCGGTATGGACTTCCAGAATCAGAAATTTCT  
80▶ R H K V L I M E F C P C G S L Y T V L E E P S N A Y G L P E S E F L

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**ApaLI (955)**  
901 CATTGTCTTACGAGATGTGGTGGCGGGATGAATCATCTCCGAGAGAAGCGCATAGTGACCCGAGATATCAAGCCAGGCAACATCATGCGCGTCATAGGG  
113▶ I V L R D V V G G M N H L R E N G I V H R D I K P G N I M R V I G

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**XhoI (1043)**  
**BsrGI (1016)** **BsrBI (1040)**  
1001 GAGGACGCCAGTCTGTGTACAAACTCAGGATTTCCGGCGCGCTCGAGAGCTGGAGACGATGAGCAGTTTGTGTCTGTACGGCACAGAAGATGACC  
147▶ E D G Q S V Y K L T D F G A A R E L E D D E Q F V S L Y G T E E Y

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**PciI (1109)**  
**BspLU11I (1109)**  
**BspEI (1104)**  
1101 TGCATCCGGACATGATGAAAGGGCAGTGCTAAGAAAGGACCATCAGAAGAAGTACGGGGCTACCGTTGATCTGTGGAGTGTGGAGTGACATCTACCA  
180▶ L H P D M Y E R A V L R K D H Q K K Y G A T V D L W S V G V T F Y H  
1201 TGCAGCCAGGGGTCGCTGCCGTTTAGACCTTTCGAGGGGCCACGGAGGAACAAGAAAGTAAATGTATAAAAATCACTGGGAGGCCGTCTGGTGCATA  
213▶ A A T G S L P F R P F E G P R R N K E V M Y K I I T G K P S G A I

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**BstXI (1327)**  
1301 TCTGGAGTACAGAAAGCAGAAAACGGACCAATTGACTGGAGTGGAGACATGCCTCTCTCTGTAGTCTTTCTCAGGGTCTTCAGGACTGCTTACCCGAG  
247▶ S G V Q K A E N G P I D W S G D M P L S C S L S Q G L Q A L L T P  
1401 TTCTTGCAAACTACTTGAAGCTGATCAGGAGAAGTGTGGGGTTTTGACCAAGTCTTTGACAGAGACCAGTGTGCTTCCAGAAATGGTGATCCATGT  
280▶ V L A N I L E A D Q E K C W G F D Q F F A E T S D V L H R M V I H V  
1501 CTTCTCGCTACAACACATGACGGCGCATAAGATTTACATTACAGCTATAAAGTGTGCTGCTGTTCCATGAACTGGTCTATAAACAACCAAGATTGTT  
313▶ F S L Q H M T A H K I Y I H S Y N T A A V F H E L V Y K Q T K I V  
1601 TCCTCAAATCAAGAACTTATCTACGAAGGACGACGCTTGTAGTCTAGAACTCGGACGACTAGCCAGCATTTCCTAAAACACAGAGGAAAATCCTATCT  
347▶ S S N Q E L I Y E G R R L V L E L G R L A Q H F P K T T E E N P I  
1701 TTGTACGAGCCGGGAACCACTCAATACCGTAGGACTGAGATGAAAAATTTCCCTCCATAAATACATCCAGCCTATGATCTGGATGGGACGCCAG  
380▶ F V T S R E Q L N T V G L R Y E K I S L P K I H P R Y D L D G D A S

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**MseI (1802)** **AseI (1872)**  
1801 CATGGCCAAAGCAGTGACGGGGTGTGTGCTACGCCTCGAAGTGCAGTACCCTGCTGCTCTATCAAGAATTAATGCGAAAGGGGTACGGTGGCTG  
413▶ M A K A V T G V V C Y A C R T A S T L L L Y Q E L M R K G V R W L  
1901 GTTGAATGGTTAAGGATGATTACAACGAGACCGTCCACAAGAAAGCAGGAGTGTGATCACACTGGATTTCTGCATCAGGAACATTGAGAAGACTGTGA  
447▶ V E L V K D D Y N E T V H K K T E V V I T L D F C I R N I E K T V  
2001 AAGTGTATGAGAAGTTGATGAAGTCAACTGGAAGCCGAGAGCTGGGTGAGATTTAGACATACACACCAAGCTGCTGAGACTTTCCAGTCTCAGGG  
480▶ K V Y E K L M K V N L E A A E L G E I S D I H T K L L R L S S S Q G  
2101 AACAATAGAAAGCAGTCTTCCAGGACATCAGCAGCAGGCTGTCTCCAGGGGCTGCTGGCCGACACTGGGCACATCAAGAAGGCACGATCCAAGAGAC  
513▶ T I E S S L Q D I S S R L S P G G L L A D T W A H Q E G T H P R D

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**EcoO109I (2219)**  
2201 AGGAATGTAGAAAACTGCAGGTCCTGTTGAACTGCATCACAGAGATTACTATCAGTTCAAAAAAGACAAGCAGAACCGAGACTAGCTTATAATGAAG  
547▶ R N V E K L Q V L L N C I T E I Y Y Q F K K D K A E R R L A Y N E  
2301 AACAGATCCACAAATTTGATAAGCAAAATTTGATTACATGCCACAAAAGCAATGAGCCACTTCTCAGAAGAATGTGTTAGAAAGTATGAAGCGTTTAA  
580▶ E Q I H K F D K Q K L Y Y H A T K A M S H F S E E C V R K Y E A F K

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**PvuII (2446)**  
2401 AGATAAGTCGGAAGAGTGGATGAGAAAGTGTCTTACTCTAGGAAGCAGCTGTTATCGCTAACTAATCAGTGTTCGATATCGAAGAGGAAGTGTCCAAG  
613▶ D K S E E W M R K M L H L R K Q L L S L T N Q C F D I E E E V S K

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**NcoI (2576)**  
2501 TATCAAGACTATACTAACGAGTTACAAGAACTCTGCCTCAGAAAATGCTCGCAGCCTCCGGCGGCTCAAGCACGCCATGGCCCGATCTACCCAGCT  
647▶ Y Q D Y T N E L Q E T L P Q K M L A A S G G V K H A M A P I Y P S  
2601 CTAACACCTTAGTGGAGATGACTTGTGATGAAGAAGTTAAAGGAGGAGATGGAAGGCGTGGTTAAGGAGCTGGCCGAGAACATCATATTTTGAAGAG  
680▶ S N T L V E M T L G M K K L K E E M E G V V K E L A E N N H I L E R

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**BamHI (2749)** **NdeI (2789)**  
2701 GTTTGGGCTTTTAAACATGGATGGTGGCCTTCGCAATGTGGACTGCTTGGATCCTATCCCTATGATGTGCCAGACTATGCTGGCTATCCATATGATGTT  
713▶ F G S L T M D G G L R N V D C L G S Y P Y D V P D Y A G Y P Y D V

MscI (2852)

2801 CCTGATTATGCTGGATACCCCTTATGATGTGCCAGACATATGCCTAAAGCTAGCTGGCCAGACATGATAAGATACATTGATGAGTTTGGACAAACCACAAT  
747 ▶ P D Y A G Y P Y D V P D Y A •

NheI (2846)

HpaI (2984)

2901 AGAATGCAGTGAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAAACAAAGTTAACAAACAACAAAT

EcoRI (3080)

3001 GCATTCATTTTATGTTTCAGGTTCCAGGGGAGGTGTGGGAGTTTTTTAAAGCAAGTAAACCTCTACAAATGTGGTATGGAAATTCTAAAATACAGCATA  
3101 GCAAACTTTAACCTCCAATCAAGCTCTACTTGAATCCTTTCTGAGGGATGAATAAGGCATAGGCATCAGGGGCTGTTGCCAATGTGCATTAGCTGT  
3201 TTGCAGCCTCACCTTCTTTCATGGAGTTAAGATATAGTGTATTTTCCCAAGTTTGAAGTCTCTTCATTCTTTATGTTTTAAATGCACTGACCTCC

SspI (3319) SwaI (3333) EcoO109I (3394)

3301 CACATTCCTTTTTAGTAAATATTCAGAAATAATTTAAATACATCATTGCAATGAAATAAATGTTTTTTATTAGGCAGAATCCAGATGCTCAAGGCC

3401 TTCATAATATCCCCAGTTAGTAGTTGGACTTAGGGAACAAAGGAACCTTAAATAGAAATTGGACAGCAAGAAAGCGAGCTTCTAGCTTTAGTTCTCTGG  
141 ◀ • N R T

SacI (3594) Ecl136II (3594)

3501 TGACTTGGAGGGGATGAGTTCCTCAATGGTGGTTTTGACCAGCTTGCATTCTCAATGAGCACAAGCAGTCAGGAGCATAGTCAGAGATGAGCTC  
137 ◀ 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 S I L E

BstXI (3623)

3601 TCTGCACATGCCACAGGGGCTGACCACCTGATGGATCTGTCCACCTCATCAGAGTAGGGGTGCTGACAGCCACAATGGTGTCAAAGTCTTCTGCCCG  
104 ◀ 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 D K Q G

StuI (3758)

3701 TTGCTCACAGCAGCCCAATGGCAATGGCTTCAGCAGACAGTACCTGCCAATGTAGGCCTCAATGTGGACAGCAGAGATGATCTCCCAGTCTTGG  
70 ◀ 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 G T K T  
3801 TCCTGATGGCCGCCGACATGGTCTTGTCTCCTCATAGAGCATGGTGTCTTCTCAGTGGCAGCTCCACCAGCTCCAGATCCTGCTGAGAGATGTT  
37 ◀ 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 Q S I N

BspHI (3908)

XmnI (3900) AseI (3966)

3901 GAAGGTCTTCATGATGGCCCTCTATAGTGAGTCGTATTATACTATGCCGATATACTATGCCGATGATTAATTGTCAAACAGCGTGGATGGCGTCTCCA  
4 ◀ F T K M

SacI (4023) Ecl136II (4023)

4001 GCTTATCTGACGGTTCATAACGAGCTCTGCTTATATAGACCTCCACCGTACACGCCTACCGCCATTTGCGTCAATGGGCGGAGTTGTTACGACAT

SpeI (4121)

4101 TTTGAAAGTCCCGTTGATTACTAGTCAAAACAACTCCCATTGACGTCAATGGGGTGGAGACTTGAAATCCCGTGAGTCAAACCGCTATCCACGCC

SnaBI (4249)

4201 CATTGATGACTGCCAAAACCGCATCATCATGGTAATAGCGATGACTAATACGTAGATGTAAGTCCCAAGTAGGAAAGTCCCATAGGTCATGACTGGCC

NdeI (4354)

4301 ATAATGCCAGGCGGGCCATTACCCTGATTGACGTCAATAGGGGGCTACTTGGCATATGATACACTTGTACTGCAAGTGGGCGAGTTACCCTAAA  
4401 TACTCCACCCATTGACGTCAATGGAAAGTCCCTATTGGCGTACTATGGGAACATACGTCAATTATTGACGTCAATGGGCGGGGCTGTTGGGCGGTGAGC

PacI (4540) SdaI (4532) PciI (4550) SbfI (4532) BspLU11I (4550)

4501 CAGGCGGGCCATTTACCGTAAGTTATGTAACGCTGCAGGTTAATTAAGAACATGTGAGCAAAAGGCCAGAAAAGCCAGGAACCGTAAAAAGCGCCGG  
4601 TTGCTGGCGTTTTCCATAGGCTCCGCCCCCTGACGAGCATCAGAAAATCGACGCTCAAGTCAGAGGTGGCAAAACCGACAGGACTATAAGATACC  
4701 AGGCGTTTTCCCGTGAAGCTCCCTGTCGCTCTCTGTTCCGACCTGCCGCTTACCGGATACCTGTCCGCTTTCTCCCTTCGGGAAGCGTGGCGCT

ApaLI (4864)

4801 TTCTCATAGCTCACGCTGAGGTATCTCAGTTCGGTGTAGTTCGTTCCGCTCAAGCTGGGCTGTGTGACGAAACCCCGTTCCAGCCGACCGCTGCGCC  
4901 TTATCCGGTAACTATCGTCTTGTAGTCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAG  
5001 GCGGTGCTACAGAGTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAA  
5101 AAGAGTTGGTAGCTCTTGATCCGGCAAAACAAACCCGCTGGTAGCGGTGGTTTTTTTGTGCAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAA

PacI (5280) SwaI (5289) NotI (5299)

5201 GAAGATCCTTTGATCTTTTCTACGGGCTGACGCTCAGTGGAAACGAAACTCACGTTAAGGGATTTTGGTCATGGCTAGTTAATTAACATTTAAATCAG

EagI (5300)

5301 CCGCCGCAATAAATATCTTTATTTTTCATTACATCTGTGTGGTTTTTGTGTGAATCGTAACATAACGCTCTCCATCAAAACAAAACGAAACAA  
5401 AACAAACTAGCAAAATAGGCTGTCCCCAGTGAAGTGCAGGTGCCAGAACATTTCTCTATCGAA