



**PvuI (7)**  
**SgfI (6)**
**MfeI (82)**

1 GGATCTGCATCGCTCCGGTGCCCGTCAGTGGGAGAGCGCACATCGCCACAGTCCCCGAGAAGTTGGGGGAGGGGTGGCAATTGAACGGGTGCCTA

101 GAGAAAGTGGCGCGGGTAAACTGGAAAAGTGTCTGTACTGGCTCCGCCTTTTTCCGAGGGTGGGGGAGAACCCTATATAAGTGCAGTAGTCGCC

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**HindIII (245)**

**Psp1406I (203)**
**PvuII (239)**

201 GTGAACGTTCTTTTTTCGCAACGGGTTTGCCGCCAGAACACAGCTGAAGCTTCGAGGGCTCGCATCTCTCTTACGCGCCGCCCTACCTGAGGCC

301 GCCATCCACGCCGGTTGAGTCGCGTTTCTGCCGCTCCCGCTGTGGTGCTCCTGAACTGCGTCCGCCGTCTAGGTAAGTTTAAAGCTCAGGTCGAGACC

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**NgoMIV (441)**

401 GGGCCTTTGTCCGGCGCTCCCTTGAGCCTACCTAGACTCAGCCGGCTCTCCACGCTTTCCTGACCTGCTTCTCAACTCTACGCTTTTGTTCGTTT

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**AgeI (552) BspHI (560)**

501 TCTGTTCTGCGCCGTTACAGATCCAAGCTGTGACCGCGCTACCTGAGATCACCGGTATCATGAGCAGCGGCCAACATCACCTATGCCAGCCGCAA

601 GCGGCGCAAGCCGGTGCAGAAAACAGTAAAGCCATCCCGCTGAAGGAATTAAGTCAAATCCTTCTAAGCGACACAGAGACCGGCTGAACACAGAGTTA

13▶ R R K P V Q K T V K P I P A E G I K S N P S K R H R D R L N T E L

**AseI (739)**

701 GATCGCCTGGCCAGCCTGCTGCCCTCCCGCAAGATGTTATTAATAAGCTGGACAACTCTCTGTTCTTAGGCTCAGCGTCAGCTACCTGAGGGCCAAGA

47▶ D R L A S L L P F P Q D V I N K L D K L S V L R L S V S Y L R A K

**BstAPI (882)**

801 GCTTCTTTGATGTTGCATTAAGTCCACCCCTGCTGACAGAAATGGAGGCCAGGACAGTGTAGAGCACAATCAGAGACTGGCAGGATTTGCAAGAAGG

80▶ S F F D V A L K S T P A D R N G G Q D Q C R A Q I R D W Q D L Q E G

901 AGAGTTCTTGTACAGCGCTGAATGGCTTTGTCTGGTTGTCACAGCAGATGCCTTGGTCTTCTATGCTTCTCCACTATCCAAGATTACCTGGGCTTT

113▶ E F L L Q A L N G F V L V V T A D A L V F Y A S S T I Q D Y L G F

**EcoRI (1060)**

1001 CAGCAGTCTGATGTCATCCATCAGAGCGTATATGAGCTCATCCATACAGAAGACCGGGCGAATTCAGCGCCAGCTTCACTGGGCTCTAAACCAGACT

147▶ Q Q S D V I H Q S V Y E L I H T E D R A E F Q R Q L H W A L N P D

**NcoI (1122)**

1101 CTGCACAAGGAGTGGACGAAGCCATGGCCCTCCACAGGCAGCAGTCTATTATACCCAGACCAGTCTCTCCAGAGAACGCTTCTTTCATGGAGAGGTG

180▶ S A Q G V D E A H G P P Q A A V Y Y T P D Q L P P E N A S F M E R C

**NgoMIV (1208)**

1201 CTTCAGGTGCCGGCTGAGGTGCCTGCTGGATAATTCATCTGGTTTTCTGGCAATGAATTTCCAAGGGAGGTTAAAGTATCTTCATGGACAGAACAAGAAA

213▶ F R C R L R C L L D N S S G F L A M N F Q G R L K Y L H G Q N K K

**BstBI (1382)**

1301 GGGAAGGACGGAGCACTGCTTCTCCACAAGTGGCTTTGTTGCAATAGTACTCCACTTCAGCCACCCTCCATCCTGGAATTCGAACCAAAAACCTCA

247▶ G K D G A L L P P Q L A L F A I A T P L Q P P S I L E I R T K N F

**ApaLI (1488)**

1401 TCTTCAGGACCAAAACACAAGCTAGACTTCACACCTATTGGTTGTGATGCCAAAGGGCAGCTTATTCTGGGCTATACAGAAGTAGAGCTGTGCACAAGAGG

280▶ I F R T K H K L D F T P I G C D A K G Q L I L G Y T E V E L C T R G

**Acc65I (1505)**

1501 ATCGGGGTACCAGTTCATCCACGCTGCAGACATGCTTCACTGTGCAGAATCCACATCCGCATGATTAAGACTGGAGAAAAGTGGCATGACAGTTTTCCGG

313▶ S G Y Q F I H A A D M L H C A E S H I R M I K T G E S G M T V F R

1601 CTTTTTGCAAAACACAGTCGCTGGAGGTGGTCCAGTCCAATGCACGCTTGATTTACAGAAAAGGAAGACCAGATTACATCATGCCACTCAGAGACCAC

347▶ L F A K H S R W R W V Q S N A R L I Y R N G R P D Y I I A T Q R P

1701 TGACGGATGAAGAAGGACGAGAGCATTACAGAAGCGAAGTACGTGCTGCCCTTCATGTTTGTACCGGAGAGGCTGTGTTGTACGAGATCTCCAGCCC

380▶ L T D E E G R E H L Q K R S T S L P F M F A T G E A V L Y E I S S P

**BamHI (1815)**

1801 TTTCTCTCCATAATGGATCCCCTACCAATACGCACCAAAAGCAACACTAGCAGGAAAGACTGGGCTCCCCAGTCAACCCCAAGTAAGGATCTTTCCAC

413▶ F S P I M D P L P I R T K S N T S R K D W A P Q S T P S K D S F H

1901 CCCAGTTCTTATGAGTGCCCTCATCCAGCAGGATGAGTCCATCTATCTATGCTCCTCTCAAGCCCTGCGCCGTTAGACAGCCATTTTCTCATGGGCT

447▶ P S S L M S A L I Q Q D E S I Y L C P P S S P A P L D S H F L M G

**EagI (2036)**  
**NotI (2035)**

2001 CCGTGAGCAAGTGCAGGAGTTGGCAAGACAGCTTTGCGGCCGAGGAAGTGGGCTGCGCTGAAACATGAGCAAATGGCCATGCTCAGGACGTGAACCT

480▶ S V S K C G S W Q D S F A A A G S E A A L K H E Q I G H A Q D V N L

**BspEI (2130) BsrGI (2153)**

2101 TGCACTCTGCGGCCCTCAGAGCTCTTCCGGATAATAAAAATAATGACTTGTACAACATCATGAGGAACCTGGGATTGATTTGAAGATATCAGA

513▶ A L S G G P S E L F P D N K N N D L Y N I M R N L G I D F E D I R

**SphI (2201)**

2201 AGCATGCAGAACGAGGAGTCTTCAGAAGTACTCCACCGCCGCTGGTGGAGTTGACTTCAAAGACATCGACATAACGGACGAAATCCTGACCTACGTGC

547▶ S M Q N E E F F R T D S T A A G E V D F K D I D I T D E I L T Y V

2301 AGGATTCCTGAACAATCAACTTTGATGAACTCCGCTTGCCAGCAGCAGCTGTGACTCAGCACCTAAGCTGTATGCTGAGGAGCCCTGCAGCTAGA

580▶ Q D S L N N S T L M N S A C Q Q Q P V T Q H L S C M L Q E R L Q L E

PvuII (2452)

2401 GCAACAGCAACAGCTTCAGCAGCCCCGCCGAGGCTCTGGAGCCCCAGCAGCAGCTGTGTAGATGGTGTGCCCCAGCAAGATCTGGGTCCGAAGCAC  
613▶ Q Q Q Q L Q Q P P P Q A L E P Q Q Q L C Q M V C P Q Q D L G P K H

2501 ACGCAAATCAACGGCAGCTTTGCAAGTTGGAACCCACCCCTCCCGTGTCTTTCAACTGTCCCCAGCAGGAACATAAGCACTATCAGCTCTTTCCAGCT  
647▶ T Q I N G T F A S W N P T P P V S F N C P Q Q E L K H Y Q L F S S

2601 TACAGGGGACTGCTCAGGAATTTCCCTACAAACCAGAGGTGGACAGTGTGCCTTACACACAGAAGCTTTGCTCCTGTAATCAGCCTCTGCTTCCAGAACA  
680▶ L Q G T A Q E F P Y K P E V D S V P Y T Q N F A P C N Q P L L P E H

2701 TTCCAAGAGTGTGCAGTTGGACTTCCCTGGAAGGGATTTTGAACCATCCCTGCATCCCACTACTTCTAATTTAGATTTTGTCAAGTTGTTTACAAGTTCT  
713▶ S K S V Q L D F P G R D F E P S L H P T T S N L D F V S C L Q V P

BstXI (2805) NcoI (2834) BstAPI (2851)

2801 GAAAACCAAAGTCATGGGATAAACTCACAGTCCACCATGGTCAGTCCCTCAGGCATACTATGCTGGGGCCATGTCCATGTATCAGTGCCAGCCAGGGCCAC  
747▶ E N Q S H G I N S Q S T M V S P Q A Y Y A G A M S M Y Q C Q P G P

2901 AGCGCACCCCTGTGGACAGACGACGTACAGTCTGAAATTCAGGTTCTCAGGCATTTCTAAGCAAGGTGCAGAGTCGAGGTATTTTCAATGAAACCTA  
780▶ Q R T P V D Q T Q Y S S E I P G S Q A F L S K V Q S R G I F N E T Y

DraIII (3089)

3001 TTCGTCCGACTTGAGCAGCATTGGCCACGCTGCTCAGACCACTGGCCATCTCCATCACCTGGCGGAAGCCCGGCTCTTCCCGATATCACACCTGGTGA  
813▶ S S D L S S I G H A A Q T T G H L H H L A E A R P L P D I T P G G

NheI (3116)

3101 TTCCTGTAGTCCCATGCTAGCTGGCCAGACATGATAAGATACATTGATGAGTTTGGACAAACCACAACCTAGAATGCAGTGAAAAAATGCTTTATTTGT  
847▶ F L •

HpaI (3254) MfeI (3265)

3201 GAAATTTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAAACCAAGTTAACAAACAATTGCATTCAATTTATGTTTCAGGTTTCAGGGGG

EcoRI (3350)

3301 AAGTGTGGGAGGTTTTTAAAGCAAGTAAAACCTCTACAAATGTGGTATGGAATTCATAAATACAGCATAGCAAACTTTAACCTCCAAATCAAGCCTCT  
3401 ACTTGAATCCTTTTCTGAGGGATGAATAAGGCATAGGCATCAGGGGCTGTTGCCAATGTGCATTAGCTGTTTGCAGCCTCACCTTCTTTCATGGAGTTTA

SapI (3532) SspI (3589)

3501 AGATATAGTGTATTTTCCAAGGTTTGAAGTAGCTCTTCATTTCTTTATGTTTTAAATGCACTGACCTCCACATTCCCTTTTAGTAAAATATTCAGAA

SwaI (3603) EcoO109I (3664)

3601 ATAATTTAAATACATCATTGCAATGAAATAAATGTTTTTTATTAGGCAGAATCCAGATGCTCAAGGCCCTCATAATATCCCCAGTTTAGTAGTTGGA  
3701 CTTAGGGAACAAAGAACCTTTAATAGAAATTGACAGCAAGAAAGCGAGCTTCTAGCTTTAGTTCCTGGTGTACTTGAGGGGATGAGTTCCTCAATGG  
141◀ • N R T Y K L P I L E E I T

BstXI (3893)

3801 TGGTTTTGACCAGCTTGGCATTTCATCTCAATGAGCACAAGCAGTCAGGAGCATAGTCAGAGATGAGCTCTCTGCACATGCCACAGGGGCTGACCACCT  
127◀ T K V L K G N M E I L V F C D P A Y D S I L E R C M G C P S V R

3901 GATGGATCTGTCCACCTCATCAGAGTAGGGGCTGACAGCCACAATGGTGTCAAAGTCTTCTGCCGTTGCTCACAGCAGACCAATGGCAATGGCT  
94◀ I S R D V E D S Y P H R V A V I T D F D K Q G N S V A S G I A I A

StuI (4028)

4001 TCAGCACAGACAGTGACCTGCCAATGTAGGCCTCAATGTGGACAGCAGAGATGATCTCCCCAGTCTTGGTCTGATGGCCGCCCCGACATGGTGCTGT  
60◀ E A C V T V R G I Y A E I H V A S I I E G T K T R I A A G V H H K N

XmnI (4170)

4101 TGTCTCATAGAGCATGGTATCTTCTCAGTGGCGACCTCCACCAGCTCCAGATCCTGCTGAGAGATGTTGAAGGTCTTCATGGTGGCCCTCTATAGTG  
27◀ D E Y L M T I K E T A V E V L E L D Q Q S I N F T K M

AseI (4236)

4201 AGTCGTATTATACTATGCCGATATACTATGCCGATGATTAATTGTCAAACAGCGTGGATGGCGTCTCCAGCTTATCTGACGGTTCACTAAACGAGCTCT

SpeI (4391)

4301 GCTTATATAGACCTCCCACCGTACACGCCTACCGCCATTTGCGTCAATGGGCGGAGTTGTTACGACATTTTGGAAAGTCCCCTGATTACTAGTCAA  
4401 AACAACTCCCATTGACGTCAATGGGGTGGAGACTTGGAAATCCCCGTGAGTCAAACCGCTATCCACGCCATTGATGTAAGTCCAAAACCGCATCATCA

SnaBI (4519)

4501 TGGTAATAGCGATGACTAATACGTAGATGTAAGTCCCAAGTAGGAAAGTCCCATAAGGTCATGTAAGTGGCATAATGCCAGGCGGGCCATTTACCGTCATT

NdeI (4624)

4601 GACGTCAATAGGGGGCTACTTGGCATATGATACACTTGTACTGCAAGTGGGAGTTTACCCTAAATACTCCACCCATTGACGTCAATGGAAAGTC  
4701 CCTATTGGCGTTACTATGGGAACATACGTCTATTATTGACGTCAATGGGCGGGGCTGTTGGGCGGTACGCCAGGCGGGCCATTTACCGTAAGTTATGTAA

PacI (4810) SdaI (4802) BspLU11I (4820)

4801 CGCCTGCAGGTTAAATTAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCTTGTGGCGTTTTTCCATAGGCTCCGCCCC  
4901 CCTGACGAGCATCAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCTTTCCCTGGAAGCTCCCTCGTGC

5001 GCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGCGCCTTTCTCATAGCTCACGCTGTAGGTATCTCAG

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ApaLI (5134)

5101 TTCGGTGTAGGTCGTTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCGTTCAGCCCGACCCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAAC

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5201 CCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGC

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5301 CTAACACGGCTACACTAGAAGAAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACA

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5401 AACCACCGCTGGTAGCGGTGTTTTTTTTGTTTGAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGTCT

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EagI (5570)

PacI (5550) SwaI (5559) NotI (5569)

5501 GACGCTCAGTGGAACGAAAACTCACGTTAAGGGATTTTGGTCATGGCTAGTTAATTAACATTTAAATCAGCGGCCGCAATAAAATATCTTTATTTTCATT

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5601 ACATCTGTGTGTTGGTTTTTTGTGTGAATCGTAACTAACATACGCTCTCCATCAAACAAAACGAAACAAAACAACTAGCAAATAGGCTGTCCCCAGT

5701 GCAAGTGCAGGTGCCAGAACATTTCTCTATCGAA