



**PvuI (7)**  
**SgfI (6)** 1 GGATCTGGATCGCTCCGGTGCCCGTCAGTGGGAGAGCGCACATCGCCACAGTCCCGGAGAAGTTGGGGGAGGGGTGGCAATTGAACGGGTGCCTA  
**MfeI (82)**  
101 GAGAAGTGGCGCGGGTAAACTGGAAAGTGATGCTGTACTGGTCCGCCTTTTCCGAGGGTGGGGGAGAACCCTATATAAGTGCAGTAGTCGCC

**Psp1406I (203)** 201 GTGAACGTTCTTTTTCGCAACGGGTTTGGCCGAGAACACAGCTGAAGCTTCGAGGGCTCGCATCTCTCTTACGCGCCCGCCCTACCTGAGGCC  
**HindIII (245)**  
**Bsu36I (291)**  
301 GCCATCCAGCGCGGTTGAGTCGCGTTTCTGCCGCTCCCGCCTGTGGTGCCTCCTGAAGTGCCTCCGCGCTAGGTAAGTTAAAGCTCAGGTCGAGACC

401 GGGCCTTTGTCCGGCGCTCCCTTGAGCCTACCTAGACTCAGCCGGCTCTCCACGCTTGGCTGACCCTGCTTGTCAACTCTACGCTTTGTTTCGTTT  
**NgoMIV (441)**  
**NaeI (441)**

501 TCTGTTCTGCGCGCTTACAGATCCAAGCTGTGACCGCGCGCTACCTGAGATCACCGGTCATCATGAACCTCCCAACGAGTCCGCAAGATGGGATGTCAG  
**KasI (535)** **AgeI (552)** **BspHI (560)**  
1 M N S P N E S A D G M S

600 GTCGGAACCATCCTTGGAAATCCTGCCGCGACTTCTGACAGCATCCCTGTGACAGTGGAGGTGAAGCCGTGCTGCCAAGAGCCATGCCAGTTC  
13 G R E P S L E I L P R T S L H S I P V T V E V K P V L P R A M P S S  
700 CATGGGGGTGGGGTGGAGGCAGCCCCAGCCCTGTGGAGCTACGGGGGCTCTGGTGGCTCTGTGGACCCACACTGCGGGAGCAGCAACTGCAGCAG  
46 M G G G G G S P S P V E L R G A L V G S V D P T L R E Q Q L Q Q  
800 GAGCTCTGGCGTCAAGCAGCAGCAGCTGCAAGAAGCAGCTGTTGCTGAGTCCAGAAACAGCATGACCACCTGACAAGGCAGCATGAGGTTCC  
80 E L L A L K Q Q Q L Q K Q L F A E F Q K Q H D H L T R Q H E V  
900 AGTGCAGAAGCACTCAAGCAGCAGCAGGAGATGCTGGCAGCCAAAGCAGCAGGAGATGCTGGCAGCAAGCGGCAGCAGGAGCTGGAGCAGCAGCG  
113 Q L Q K H L K Q Q Q E M L A A K Q Q Q E M L A A K R Q Q E L E Q Q R  
1000 GCAGCGGAGCAGCAGCGCAGGAAAGAGCTGGAGAAGCAGCGCTGGAGCAGCAGCTGCTCATCTGCGGAACAAGGAGAAAGCAAAGAGAGTGCCATT  
146 Q R E Q Q R Q E E L E K Q R L E Q Q L L I L R N K E K S K E S A I

1100 GCCAGACTGAGGTAAAGCTGAGGCTCCAGGAATTCCTTGTGCAAGTCAAAGGAGCCACACCAGGCGCCTCAACCATTCCCTCCACAGCACCCCA  
180 A S T E V K L R L Q E F L L S K S K E P T P G G L N H S L P Q H P  
**EcoRI (1129)**

1200 AATGCTGGGAGCCACCATGCTTCTTTGGACCAGAGTCCCTCCCCAGAGCGGCCCTGGGAGCCTCCCTCCTACAAACTGCCTTTGGCC  
**Bsp120I (1294)**  
213 K C W G A H H A S L D Q S S P P Q S G P P G T P P S Y K L P L P G P  
1300 CTACGACAGTCGAGACGACTTCCCCTCCGCAAAACAGCCTCTGAACCAACTGAAAGTGCCTTCAAGGCTAAAACAGAAGGTGGCTGAGCGGAGAAGC  
246 Y D S R D D F P L R K T A S E P N L K V R S R L K Q K V A E R R S  
1400 AGTCCCCTCTGCGTGCAGGATGGGACTGTTATTAGCACCTTTAAGAAGAGAGCTGTTGAGATCACAGGTGCGGGGCTGGGGCGTCCGTTGTGTA  
280 S P L R R K D G T V I S T F K K R A V E I T G A G P G A S S V C  
1500 ACAGCAGCCCGCTCCGCGCCAGCTTCCCAACAGCTCCACAGCATTGCTGAGAATGGCTTTACTGGCTCAGTCCCAACATCCCCACTGAGAT  
313 N S A P G S G P S S P N S S H S T I A E N G F T G S V P N I P T E M

1600 GCTCCCTCAGCACCGAGCCCTCCCTCTGGACAGCTCCCCAACAGTTCAGCCTCTACAGTCTCCTTCTGCCCCAACATCTCCCTAGGGCTGCAGGCC  
346 L P Q H R A L P L D S S P N Q F S L Y T S P S L P N I S L G L Q A  
**AvrII (1683)**

1700 ACGGTCACTGTCACCAACTCACACCTCACTGCCTCCCCAAGCTGTCGACACAGCAGGAGGCCGAGAGGCAGGCCCTCAGTCCCTGCGGCAGGGTGGCA  
380 T V T V T N S H L T A S P K L S T Q Q E A E R Q A L Q S L R Q G G  
**SalI (1743)**

1800 CGTGACCGCAAGTTTCATGAGCACATCTTATTCTGGCTGCTGTTGGGCGTGGCACTGGAGGGGACGGGAGCCCCACGGGCATGCTCCCTGCT  
413 T L T G K F M S T S S I P G C L L G V A L E G D G S P H G H A S L L  
**BspHI (1814)**

1900 GCAGCATGTGCTGTTGCTGGAGCAGGCCCGGCAGCAGACCCCTATTGCTGTGCCACTCCACGGGCAGTCCCCACTAGTGACGGGTGAACGTGTGGCC  
446 Q H V L L L E Q A R Q S T L I A V P L H G Q S P L V T G E R V A  
**SpeI (1974)**

2000 ACCAGCATGCGGACGGTAGGCAAGCTCCCGCGGCATCGGCCCTGAGCCGCACTCAGTCTCACCGCTGCCGAGAGTCCCCAGGCCCTGCAGCAGCTGG  
480 T S M R T V G K L P R H R P L S R T Q S S P L P Q S P Q A L Q Q L  
2100 TCATGCAACAACAGCACCAGCAGTTCCTGGAGAAGCAGAAGCAGCAGCTACAGCTGGGCAAGATCCTCACAAGACAGGGAGCTGCCAGGCAGCC  
513 V M Q Q Q H Q Q F L E K Q K Q Q L Q L G K I L T K T G E L P R Q P

2200 CACCACCCACCTGAGGAGACAGAGGAGGAGCTGACGGAGCAGCAGGAGTCTTGTGGGGGAGGAGCCCTGACCATGCCCCGGGAGGGCTCCACAGAG  
546 T T H P E E T E E E L T E Q Q E V L L G E G A L T M P R E G S T E  
**Bsu36I (2209)** **XmaI (2279)**

2300 AGTGAGAGCACACAGGAAGACCTGGAGGAGGAGGACGAGGAAGAGGATGGGGGAGGAGGAGGATTGCATCCAGGTTAAGGACGAGGAGGGCGAGAGT  
580 S E S T Q E D L E E E D E E E D G E E E E D C I Q V K D E E G E S  
**BbsI (2314)**

2400 GTGCTGAGGAGGGCCGACTTGGAGGAGCCTGGTCTGGATAAAAAAAGTGTCTCAGATGCCAGCCGCTGCAGCCTTTGCAGGTGTACCGGCC  
613 G A E E G P D L E E P G A G Y K K L F S D A Q P L Q P L Q V Y Q A P  
2500 CCTCAGCTGGCCACTGTGCCACCCAGGCCCTGGGCCGTACCAGTCTCCCTGCTGCCCTGGGGCATGAAGAGCCCCCAGACCAGCCGCTCAAG  
646 L S L A T V P H Q A L G R T Q S S P A A P G G M K S P P D Q P V K

2600 CACCTCTTACCACAGGTGGTCTACGACAGTTCATGCTAAAGCACCAGTGCATGTGCGGGAACACACAGTGCACCCTGAGCATGCTGGCCGGATCC  
680 H L F T T G V V Y D T F M L K H Q C M C G N T H V H P E H A G R I  
**BbrPI (2668)** **BamHI (2693)**

2700 AGAGCATCTGGTCCCGGCTGAGGACAGGCGCTTAGCAAGTGGCAGCGGATCCGAGGTCGCAAAGCCACGCTAGATGAGATCCAGACAGTGCCTC  
713 Q S I W S R L Q E T G L L S K C E R I R G R K A T L D E I Q T V H S  
2800 TGAATACCACACCCCTGCTCTATGGGACCAAGTCCCTCAACCGGCAAGCTAGACAGCAAGAAATTGCTCGGCCCATCAGCCAGAAGATGTATGCTGTG  
746 E Y H T L L Y G T S P L N R Q K L D S K K L L G P I S Q K M Y A V

**DraIII (2931)** **FspI (2966)**

2900 CTGCCTTGTGGGGGCATCGGGGTGGACAGTGCACCGTGTGGAATGAGATGCACTCCTCCAGTGTGCGCATGGCAGTGGGCTGCCTGCTGGAGCTGG  
780 L P C G G I G V D S D T V W N E M H S S S A V R M A V G C L L E L  
3000 CCTTCAAGGTGGCTGAGGAGAGCTCAAGAATGGATTTGCCATCATCCGGCCCCAGGACACCCAGCCGAGGAATCCACAGCCATGGGATTCTGCTTCTT  
813 A F K V A A G E L K N G F A I I R P P G H H A E E S T A M G F C F F  
3100 CAACTCTGTAGCCATCACGCAAACTCCTACAGCAGAAGTTGAACGTGGGCAAGGTCCTCATCGTGGACTGGGACATTCACCATGGCAATGGCACCCAG  
846 N S V A I T A K L L Q Q K L N V G K V L I V D W D I H H G N G T Q  
3200 CAGGCGTTCTACAATGACCCCTCTGTGCTCTACATCTCTGCATCGTATGACAACGGGAACCTCTTCCAGGCTCTGGGGCTCCTGAAGAGGTTGGT  
880 Q A F Y N D P S V L Y I S L H R Y D N G N F F P G S G A P E E V G

**XemI (3356)**

3300 GAGGACCAGGCGTGGGGTACAATGTGAACGTGGCATGGACAGGAGGTGTGACCCCGCCATTGGAGACGTGGAGTACCTTACAGCCTTACAGGACAGTGGT  
913 G G P G V G Y N V N V A W T G G V D P P I G D V E Y L T A F R T V V

**PshAI (3467)**

3400 GATGCCCATTTGCCACGAGTTTCTCACCTGATGTGGTCTAGTCTCCGCGGGTGGTGGTGTGTTGAAGGACATCTGTCTCCTCTGGGTGGCTACTCTGT  
946 M P I A H E F S P D V V L V S A G F D A V E G H L S P L G G Y S V  
3500 ACCGCCAGATGTTTTGGCCACTTGACCAGGCGAGCTGATGACCTGGCAGGGGGCCGGTGGTGTGGCCCTGGAGGGAGGCCATGACTTGACCGCCATCT  
980 T A R C F G H L T R Q L M T L A G G R V V L A L E G G H D L T A I  
3600 GTGATGCCTTGAGGCTGTGCTCGGCTGCTCAGTGTAGACTGCAGCCCTGGATGAGGACATTCGAGCAAAAAGCCCAACATCAACGAGTGGC  
1013 C D A S E A C V S A L L S V E L Q P L D E A V L Q Q K P N I N A V A  
3700 CACGCTAGAGAAAGTCATCGAGATCCAGAGCAAACTGGAGCTGTGTGAGAAAGTTCGCGCTGGTCTGGGCGGTCCTGCGAGAGGCCCAAGCAGGT  
1046 T L E K V I E I Q S K H W S C V Q K F A A G L G R S L R E A Q A G

NgoMIV (3894)  
NaeI (3894)

3800 GAGACCGAGGAGGCCGAGACTGTGAGCGCCATGGCCTTGTGTGGTGGGGCCGAGCAGGCCAGGCTGCGGAGCCCGGGAACACAGCCCCAGGCCG  
1080 E T E E A E T V S A M A L L S V G A E Q A Q A A A A R E H S P R P

**NheI (3966)**

3900 CAGAGGAGCCATGGAGCAGGAGCTGCCTGTGACGCCCGGCCCCATCCCTCTGGGCTTACCAGCTAGCTGGCCAGACATGATAAGATACATTGAT  
1113 A E E P M E Q E P A L •  
4000 GAGTTGGACAAACCACAACCTAGAATGCAGTGAATAAATGCTTTATTTGTGAATTTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATA

---

**HpaI (4104)** **MfeI (4115)**

4100 AACCAAGTTAAACAACAACAATTGCATTCTTTTATGTTTCAGGTTCCAGGGGAGGTGTGGGAGGTTTTTAAAGCAAGTAAACCTCTACAAATGTGGTAT

---

**EcoRI (4200)**

4200 GGAATCTAAAATACAGCATAGCAAACTTTAACCTCCAAATCAAGCCTCTACTTGAATCCTTTTCTGAGGGATGAATAAGGCATAGGCATCAGGGGCTG  
4300 TTGCCAATGTGCATTAGCTGTTTGCAGCCTCACCTTCTTTCATGGAGTTAAGATATAGTGTATTTTCCCAAGTTTGAAGTACTCTTCATTCTTTAT

---

**SspI (4439)** **SwaI (4453)**

4400 GTTTTAAATGCACTGACCTCCACATTCCTTTTATGTAATAATTCAGAAATAATTTAAATACATCATTGCAATGAAAATAAATGTTTTTATTAGGCA  
4500 GAATCCAGATGCTCAAGGCCCTTATAATATCCCCAGTTTAGTAGTTGGACTTAGGGAACAAAGAACCTTTAATAGAAATTGGACAGCAAGAAAGCGA

---

4600 GCTTCTAGCTTTAGTTCCTGGTGTACTTGAGGGGATGAGTTCCTCAATGGTGGTTTTGACCAGCTTGCCATTCTCAATGAGCACAAAGCAGTCAGG  
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 C D P  
4700 AGCATAGTCAGAGATGAGCTCTCTGCACATGCCACAGGGGCTGACCACCTGATGGATCTGTCCACCTATCAGAGTAGGGGCTGCTGACAGCCCAATG  
111 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 A V I

**StuI (4878)**

4800 GTGTCAAAGTCTTCTGCCGTTGCTCACAGCAGACCCAATGGCAATGGCTTCCAGCAGACAGTGCACCTGCAATGTAGGCTCAATGTGGACAGCAG  
77 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 V A S  
4900 AGATGATCTCCCAAGTCTTGGTCTGATGGCCGCCCGCATGGTCTTGTGCTCCTCATAGACATGGTATCTTCTCAGTGGCGACCTCCACCAGCTC  
44 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 V L E

**BspHI (5028)**

**BbsI (5024)** **XmnI (5020)** **AseI (5086)**

5000 CAGATCCTGCTGAGAGATGTTGAAGTCTTCTGATGGCCCTCTATAGTGTGATTATACTATGCCGATATACTATGCCGATGATTAATTGTCAA  
11 L D Q Q S I N F T K M  
5100 ACAGCGTGGATGGCGTCTCCAGCTTATCTGACGGTCACTAAACGAGCTCTGCTTATATAGACCTCCACCGTACACGCCTACCGCCATTTCGCTCAA

---

**SpeI (5241)**

5199 TGGGGCGGAGTTGTTACGACATTTTGGAAAGTCCCGTTGATTTACTAGTCAAACAAACTCCATTGACGTCAATGGGTGGAGACTTGGAAATCCCCG

---

**SnaBI (5369)**

5298 TGAGTCAAACCGCTATCCACGCCATTGATGTAAGTGCACAAACCGCATCATCATGGTAATAGCGATGACTAATACGTAGATGTAAGTGCACAAAGTAGGAAAG

---

**NdeI (5474)**

5398 TCCATAAGGTCTAGTACTGGGCATAATGCCAGGCGGGCCATTACCGTCAATTGACGTCAATAGGGGGCTACTTGGCATATGATACACTTGTACTG  
5498 CCAAGTGGCAGTTTACCCTAAATACTCCACCCATTGACGTCAATGAAAGTCCCTATTGGCGTTACTATGGGAACATACGTCAATTGACGTCAATGG

5598 GCGGGGTCGTTGGGCGGTCAGCCAGGCGGGCCATTTACCGTAAGTTATGTAACGCTGCAGGTTAA TTAAGAACATGTGAGCAAAAGGCCAGCAAAA  
5696 GGCCAGGAACCGTAAAAAGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAATCGACGCTCAAGTCAGAGGTGGCGA  
5796 AACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCCTGCCGCTTACCGGATACCTGTCCGCCT  
5896 TTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCCGCTCCAAGCTGGGCTGTGTGCACGAACC  
5996 CCCCGTTCAGCCCACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAAC  
6096 AGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGAACAGTATTTGGTATCTGCGCTC  
6196 TGCTGAAGCCAGTTACCTTCGAAAAAGAGTTGGTAGCTTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGTTTTTTGTTTGAAGCAGCAGAT  
6296 TACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGCTCTGACGCTCAGTGGAACGAAAACACTCACGTTAAGGGATTTTGGTCATG

**EagI (6420)**  
PacI (6400) SwaI (6409) **NotI (6419)**  
6396 GCTAGTTAATTAACATTTAAATC AGCGGCCGAATAAAATATCTTTATTTTCATTACATCTGTGTGGTTTTTTGTGTGAATCGTAACTAACATACGC  
6496 TCTCCATCAAAACAAAACGAAACAAAACAAACTAGCAAAATAGGCTGTCCCAGTGCAAGTGCAGGTGCCAGAACATTTCTCTATCGAA