



**PvuI (7)**  
**SgfI (6)** 1 GGATCTGCATCGCTCCGGTGCCCGTCAGTGGGAGAGCGCACATCGCCACAGTCCCGGAGAAGTTGGGGGAGGGGTGGCAATTGAACGGGTGCCTA **EcoNI (96)**

101 GAGAAGGTGGCGCGGGTAAACTGGAAAGTGATGTCGTGTAAGTGGCTCCGCCTTTTTCCGAGGGTGGGGGAGAACCCTATATAAGTGCAGTAGTCGCC

**HindIII (245)**  
**PvuII (239)** 201 GTGAACGTTCTTTTTCGCAACGGGTTTGCCGCCAGAACACAGCTGAAGCTTCGAGGGGCTCGCATCTCTCTTACCGCGCCCGCCCTACCTGAGGCC **Bsu36I (291)**  
**EcoNI (287)**

301 GCCATCCACGCGGTTGAGTGCAGTTCGCCGCTCCCGCCTGTGGTGCTCTGAACTGCGTCCGCCGTCTAGGTAAGTTTAAAGCTCAGGTCGAGACC

401 GGGCCTTTGTCCGGCGCTCCCTTGAGCCTACCTAGACTCAGCCGGCTCTCCACGCTTTGCTGACCCTGCTTGTCTAACTCTACGTCTTTGTTTCGTTT

**SphI (560)**  
**AgeI (552)** 501 TCTGTTCTGCGCGGTTACAGATCCAAGCTGTGACCGCGCGCTACCTGAGATCACCGGTCAGCATGCAGAGCACTTCTAATCATCTGTGGCTTTTATCTGA **HindIII (690)**  
1 M Q S T S N H L W L L S D

601 TATTTTAGCCAAGGAGCTACTGCAAAATGCTTTCTGTTGAAGACATAAGAAAAGTGGTATTTTGTATCAAAGTATTTAATAACATAAGCTTCCTT

13 I L G Q G A T A N V F R G R H K K T G D L F A I K V F N N I S F L

701 CGTCCAGTGGATGTTCAAATGAGAGAATTTGAAGTGTGAAAAAAGTCAATCACAAAAATATTGCAATTTTGTATTGAAGAGGAGACAACAACAA

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

801 GACATAAAGTACTTATTATGGAATTTTGTCCATGTGGGAGTTTATACACTGTTTTAGAAAGAACCTTCTAATGCCTATGGACTACCAGAATCTGAATTTCT

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

901 AATTGTTTTGCGAGATGTGGTGGGTTGAATGAATCATCTACGAGAGAATGGTATAGTGACCCGTGATCAAGCCAGGAAATATCATGCGTGTATAGGG

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

**ScaI (807)**  
**EcoRI (892)**

1001 GAAGATGGACAGTCTGTGTACAAACTCACAGATTTTGGTGCAGCTAGAGAATTAGAAGATGATGAGCAGTTTGTCTCTGTATGGCACAGAAGAATATT

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

1101 TGCACCCTGATATGTATGAGAGAGCAGTCTAAGAAAAGATCATCAGAAGAAATAGGAGCAACAGTTGATCTTTGGAGCATTGGGGTAAACATTTTACCA

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 I G V T F Y H

**EcoO109I (1236)**

1201 TGCAGTACTGGATCACTGCCATTTAGACCCCTTGAAGGGCCTCGTAGGAATAAAGAAGTGTATATAAAATAATTACAGGAAAGCCTTCTGGTGAATA

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

**BstXI (1327)**

1301 TCTGGAGTACAGAAAGCAGAAAAAGGACCAATTTGACTGGAGTGGAGACATGCCTGTTTCTTGCAGTCTTTCTCGGGTCTTCAGGTTCTACTTACCCCTG

247 S G V Q K A E N G P I D W S G D M P V S C S L S R G L Q V L L T P

1401 TTCTTGAACAATCCTTGAAGCAGATCAGGAAAAGTGTGGGGTTTTGACCAGTTTTTTGAGAAAAGTGTATATACTTACCCGAATGGTAATTCATGT

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 I L H R M V I H V

**SpeI (1465)**

1501 TTTTTGCTACAACAAATGACAGCTCATAAGATTTATATACATAGCTATAAAGTGTACTATATTTTCACTGAACTGGTATATAAACAACCAAAATTTAT

313 F S L Q Q M T A H K I Y I H S Y N T A T I F H E L V Y K Q T K I I

1601 TCTTCAAATCAAGAACTTATCTACGAAGGGCGACGCTTAGTCTTAGAACCTGGAAGGCTGGCACAACATTTCCCTAAAAGTACTGAGGAAAACCTATAT

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

**BspHI (1566)**

1701 TTGTAGTAAGCCGGGAACCTCTGAATACCATAGGATTAATATGAAAAATTTCCCTCCCTAAAGTACATCCACGTTATGATTTAGACGGGGATGCTAG

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

**NheI (1795)**

**PstI (1836)**

1801 CATGGCTAAGGCAATAACAGGGGTTGTGTGTTATGCCTGAGAAATGGCAGTACCTTACTGCTTTATCAGGAATTAATGCGAAAAGGGGATACGATGGCTG

413 M A K A I T G V V C Y A C R I A S T L L L Y Q E L M R K G I R W L

1901 ATTGAATTAATTAAGATGATTACAATGAACTGTTTACAAAAAGACAGAAGTTGTGATCACATTGGATTTCTGTATCAGAAACATTGAAAAAAGTGTGA

447 I E L I 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

**BsaBI (2016)**

2001 AAGTATATGAAAAGTTGATGAAGATCAACCTGGAAGCGGCAGAGTTAGGTGAAATTTTACAGACATACACACCAAAATTTGAGACTTTCCAGTTCTCAGGG

480 K V Y E K L M K I 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

**EcoRV (2122)**

2101 AACAAATAGAAACAGTCTTCCAGATATCGACAGCAGATATCTCCAGGTGGATCACTGGCAGAGCATGGGCACATCAAGAAGGCACTCATCCGAAAGAC

513 T I E T S L Q D I D S R L S P G G S L A D A W A H Q E G T H P K D

2201 AGAAATGTAGAAAAACTACAAGTCTGTTAAATGTCATGACAGAGATTTACTATCAGTTCAAAAAAGCAAAAGCAGAAGCTAGATTAGCTTATAATGAAG

547 R N V E K L Q V L L N C M T E I Y Y Q F K K D K A E R R L A Y N E

2301 AACAAATCCAAAAATTTGATAAGGATGTTTACATGACCAAAAAAGCTATGACGCACTTACAGATGAATGTGTTAAAAAGTATGAGGCATTTT

580 E Q I H K F D K Q K L Y Y H A T K A M T H F T D E C V K K Y E A F L

2401 GAATAAGTCAAGAAGTGGATAAGAAAGATGCTTCATCTTAGGAAACAGTTATTATCGCTGACTAATCAGTGTGTTTATGATTGAAGAAGAGTATCAAAA

613 N K S E E W I 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

2501 TATCAAGAATACTAATGAGTTACAAGAACTGCTGCCTCAGAAAAATTTTACAGTCTCCAGTGGAAATCAAACATACCATGACCCCAATTTTCAAGTT

647 Y Q E Y T N E T Y Q E A T L P Q K M F T A S S G I K H T M T P I Y P S

2601 CTAACACATTAGTAGAAATGACTCTTGGTATGAAGAAATTAAGGAAGAGATGGAAGGGGTGGTTAAAGAAGTCTGCTGAAAAAACCACATTTTAGAAAAG

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

2701 GTTTGGCTCTTTAACCATGGATGGTGGCCTTCGCAACGTTGACTGTCTTTAGCCTAGGTCTAGCTCGACATGATAAGATACATTGATGAGTTTGGACAAA  
713▶ F G S L T M D G G L R N V D C L •

2801 CCACAAC TAGAATGCAGTGAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAACC

2901 ATTATAAGCTGCAATAAACAAAGTTAACAAACAATTGCATTCATTTTATGTTTCAGGTTTCAGGGGGAGGTGTGGGAGGTTTTTTAAAGCAAGTAAAACC

3001 TCTACAAATGTGGTATGGAAATTTAAAATACAGCATAGCAAACTTTAACCTCCAATCAAGCCTCTACTTGAATCCTTTTCTGAGGGATGAATAAGGCA  
EcoRI (3017)

3101 TAGGCATCAGGGCTGTTGCCAATGTGCATTAGCTGTTTGACGCCTCACCTTCTTTCATGGAGTTTAAGATATAGTGATTTTTCCCAAGGTTTGAAC TAG

3201 CTCTTCATTTCTTTATGTTTTAAATGCACTGACCTCCACATTCCTTTTATGATAAATATTAGAAATAATTTAAATACATCATTGCAATGAAAATAAA  
SwaI (3270)

3301 TGTTTTTTATTAGGCAGAATCCAGATGCTCAAGGCCCTTCATAATATCCCCAGTTTAGTAGTTGGACTTAGGGAACAAAGAACCTTTAATAGAAATTG  
EcoO109I (3331)

3401 GACAGCAAGAAAGCGAGCTTCTAGCTTTAGTTCCTGGTACTTGAGGGGGATGAGTTCCTCAATGGTGGTTTTGACCAGCTTGCATTTCATCTCAATGA  
141◀ • N R T Y K L P I L E I T T K V L K G N M E I L

3501 GCACAAAGCAGTCAGGAGCATAGTCAGAGATGAGCTCTCTGCACATGCCACAGGGGCTGACCACCTGATGGATCTGCCACCTCATCAGAGTAGGGGTG  
116◀ V F 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

3601 CCTGACAGCCACAATGGTGTCAAAGTCTTCTGCCCGTTGCTCACAGCAGACCAATGGCAATGGCTTCCAGCAGACAGTACCCTGCAATGTAGGCC  
83◀ R V 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

3701 TCAATGTGGACAGCAGAGATGATCTCCAGTCTTGGTCTGATGGCCGCCGACATGGTGCTGTTGTCCTCATAGAGCATGGTATCTTCTCAGTGG  
49◀ E I H 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

3801 CGACCTCCACCAGCTCCAGATCTGTGAGAGATGTTGAAGTCTTCATGGTGGCCCTCTATAGTGAGTCGTATTATACTATGCCGATATACTATGCCG  
16◀ V E V L E L D Q Q S I N F T K M

3901 ATGATTAATTGTCAAACAGCGTGGATGGCGTCTCCAGCTTATCTGACGGTCTACTAAACGAGCTCTGCTTATATAGACCTCCCACCGTACACGCCTACC  
SacI (3960)

4001 GCCCATTGCGTCAATGGGGCGGAGTTGTTACGACATTTTGGAAAGTCCCGTTGATTTACTAGTCAAACAAACTCCCATTGACGTCAATGGGGTGGAGA  
SpeI (4058)

4101 CTTGAAATCCCCGTGAGTCAAACCGCTATCCACGCCATTGATGTACTGCCAAAACCGCATCATCATGGTAATAGCGATGACTAATACGTAGATGTACT  
SnaBI (4186)

4201 GCCAAGTAGGAAAGTCCCATAAGGTCATGTACTGGCATAATGCCAGGCGGGCCATTTACCGTATTGACGTCAATAGGGGGCTACTTGGCATATGATA  
NdeI (4291)

4301 CACTTGATGTACTGCCAAGTGGGAGTTTACCGTAAATACTCCACCCATTGACGTCAATGAAAGTCCCTATTGGCGTACTATGGGAACATACGTCATT

4401 ATTGACGTCAATGGGCGGGGTCGTTGGCGGTGACCCAGGCGGGCCATTTACCGTAAGTTATGTAACGCCTGCAGGTTAATTAAGAACATGTGAGCAAA  
PstI (4470) SdaI (4469) BspLU11I (4487)

4501 AGGCCAGCAAAGGCCAGGAACCGTAAAAAGCCGCTTGTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGT

4601 CAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCTGGAAGCTCCCTCGTGCGCTCTCTGTTCCGACCTGCCGCTTACCGGAT

4701 ACCTGTCCGCTTTCTCCCTTCCGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTGCTCCAAGCTGGGCTG

4801 TGTGCACGAACCCCCGTTACGCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGTAAGACACGACTTATGCCACTGGCAGCA  
ApaLI (4801)

4901 GCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGTACAGAGTCTTGAAGTGGTGGCCTAACTACGGTACACTAGAAGAACAGTATTTG

5001 GTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTGTTTG

5101 CAAGCAGCAGATTACGCGCAGAAAAAAGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGTCTGACGCTCAGTGAACGAAAACTCACGTTAAGGG

5201 ATTTTGGTCATGGCTAGTTAATTAACATTTAAATC AGCGGCCCAATAAAAATATCTTTATTTTTCATTACATCTGTGTGTTGGTTTTTTGTGTAATCGTA  
EagI (5237) SwaI (5226) NotI (5236)

5301 ACTAACATACGCTCTCCATCAAACAAACGAAACAAACAAACTAGCAAATAGGCTGTCCCAGTGCAAGTGCAGGTGCCAGAACATTTCTCTATCGA  
5401 A