



**NotI (-1)**  
1 GCGGCCGCAATAAAATATCTTTATTTTTCATTACATCTGTGTGTTGGTTTTTGTGTGAATCGTAACTAACATACGCTCTCCATCAAACAAAACGAAACA  
PvuI (172)  
SfiI (171)  
101 AAACAACTAGCAAATAGGCTGTCCCCAGTGCAAGTGCAGGTGCCAGAACATTTCTCTATCGAAGGATCTGCGATCGCTCCGGTCCCGTCACTGGGCA

MfeI (247)  
201 GAGCGCACATCGCCACAGTCCCCGAGAAGTTGGGGGAGGGTCCGCAATTGAACGGGTGCTAGAGAAGTGGCGGGGTAAGTGGAAAGTGT  
GTCGTGACTGGCTCCGCTTTTTCCCGAGGGTGGGGGAGAACCATATAAAGTCAGTAGTCGCCGTGAACGTTCTTTTTCGCAACGGGTTTGGCCGCA

HindIII (410) Bsu36I (456)  
400 GAACACAGCTGAAGCTTCGAGGGCTCGCATCTCTCTTACCGCGCCGCCCTACCTGAGGCGCCATCCACGCCGGTTGAGTCGGTCTCGCCGCGC  
TCCCGCTGTGGTGCCTCTGAACTGCGTCCGCGCTAGGTAAGTTTAAAGCTCAGGTGAGACCGGGCTTTGTCCGGGCTCCCTTGGAGCTACCT

NaeI (606)  
600 AGACTCAGCCGGCTCCACGCTTTGCTGACCCGTGTTGCTCAACTCTACGCTTTTGTGTTTTCTGTTCTGCGCGTTACAGATCCAAGCTGTGAC

KasI (700) BstEII (720) AgeI (717)  
700 CCGCGCTACCTGAGATCaccgggtcaCATGGGTTTCTGCCGAGCGCCCTGCACCCGCTGTCTCTCTGGTGCAGGCCATCATGCTGGCCATGACCCCTG  
1 M G F C R S A L H P L S L L V Q A I M L A M T L

Acc65I (805)  
800 GCCCTGGTACCTTGCCTGCCTTCTACCTGTGAGCTCCAGCCCAAGGCTGGTGAAGTGAAGTGGCTGTTCTGAAGTCTGTGCCCACTTCTCCA  
25 A L G T L P A F L P C E L Q P H G L V N C N W L F L K S V P H F S  
900 TGGCAGCACCCCGTGGCAATGTACACAGCCTTCTCTGCTCCAAACCGCATCCACACCTCCATGATTCTGACTTTGCCCACTGGCCAGCTGCGGCA  
58 M A A P R G N V T S L S L S S N R I H H L H D S D F A H L P S L R H  
1000 TCTCAACCTCAAGTGAAGTCCCGCGGTTGGCTCAGCCCATGCACTTCCCTGCCACATGACCATCGAGCCAGCACCTTCTGGCTGTGCCACC  
91 L N L K W N C P P V G L S P M H F P C H M T I E P S T F L A V P T

BspHI (1130)  
1100 CTGGAAGAGTAAACCTGAGCTACAACAAATCATGACTGTGCCTGCGCTGCCAAATCCCTCATATCCCTGTCCCTCAGCCATACCAACATCCTGATGC  
125 L E E L N L S Y N N I M T V P A L P K S L I S L S L S H T N I L M

NaeI (1216) SphI (1224) SdaI (1274)  
1200 TAGACTTGCAGCCTCGCCGCTGATGCCCTGCGCTTCTATTATGAGCGCAACTGTTATTACAAGAACCCTGCAGCGAGGCACTGGAGGTGGC  
158 L D S A S L A G L H A L R F L F M D G N C Y Y K N P C R Q A L E V A

XmaI (1299)  
1300 CCCGGTGGCCCTTGGCCTGGGCAACCTCACCCACCTGTCACTCAAGTACAACAACTCACTGTGGTGGCCGCAACCTGCCTTCCAGCCTGGAGTAT  
191 P G A L L G L G N L T H L S L K Y N N L T V V P R N L P S S L E Y

Bsu36I (1435) KasI (1431)  
1400 CTGCTGTGCTACAACCGCATCGTCAAATGGCCCTGAGGACCTGGCCAATCTGACCCGCTCGGTGTGCTCGATGTGGCGGAAATTGCCCGCGT  
225 L L L S Y N R I V K L A P E D L A N L T A L R V L D V G G N C R R  
1500 GCGACACGCTCCAACCCCTGCATGGAGTCCCTGCTCACTTCCCGAGCTACATCCCGATACCTTACCCAGCTGAGCGCTTGAAGGCTGGTGT  
258 C D H A P N P C M E C P R H F P Q L H P D T F S H L S R L E G L V L

NsiI (1692)  
1600 GAAGGACGTTCTCTCTCTGGCTGAATGCCAGTGGTCCGTTGGGCTGGGAAACCTCCGAGTGTGGACCTGAGTGAGAAGTCTCTACAATGCATC  
291 K D S S L S W L N A S W F R G L G N L R V L D L S E N F L Y K C I

HindIII (1738)  
1700 ACTAAAACCAAGGCTTCCAGGGCCTAACACAGCTGCGCAAGCTTAACTGTCTTCAATTACAAAAGAGGGTGTCTTTGCCACCTGTCTTGCCCC  
325 T K T K A F Q G L T Q L R K L N L S F N Y Q K R V S F A H L S L A  
1800 CTTCCCTCGGAGCTGGTGCCTGAAGGAGCTGGACATGACGGCATCTTCTCGCTCACTCGATGAGACCAGCTCGCCGCTGAGCCGCTGGCCGCTGCC  
358 P S F G S L V A L K E L D M H G I F F R S L D E T T L R P L A R P  
1900 CATGCTCCAGACTCTGCGTCTGCAAGTGAACCTCATCAACAGGCCAGCTCGGCATCTTCAAGGCTTCCCTGGCCTGCGCTGAGCTGACCTGTGCG  
391 M L Q T L R L Q M N F I N Q A Q L G I F R A F P G L R Y V D L S D  
2000 AACCGCATCAGCGGAGCTTCGGAGCTGACAGCCACCATGGGGAGGAGATGGAGGGGAGAAGTGTGGCTGACGCTGGGGACCTTGTCCGGCCAG  
425 N R I S G A S E L T A T M G E A D G G E K V W L Q P G D L A P A P

BstEII (2178)  
2100 TGGACACTCCAGCTCTGAAGACTTCAGGCCAACTGCAGCACCTCAACTCACCTTGGATCTGTACGGAACAACCTGGTGACCGTGCAGCCGGAGAT  
458 V D T P S S E D F R P N C S T L N F T L D L S R N N L V T V Q P E M

AgeI (2287)  
2200 GTTTGCCAGCTCTCGACCTGCAGTGCCTGCGCTGAGCCACAACCTGCATCTCGCAGGCAGTCAATGGCTCCAGTTCTGCCGCTGACCGTCTGCAG  
491 F A Q L S H L Q C L R L S H N C I S Q A V N G S Q F L P L T G L Q  
2300 GTGCTAGACCTGTCCACAATAAGCTGGACCTTACCACAGGACTCATTACGGAGCTACCAGGACTGGAGGCTGGACCTCAGCTACAACAGCCAGC  
525 V L D L S H N K L D L Y H E H S F T E L P R L E A L D L S Y N S Q

SphI (2405)  
2400 CCTTTGGCATGCAAGGGCTGGGCCAACTTCACTGTGCTGCTGACCTGCGCCACTGCGCCACTCAGCTGGCCACAACAATCCACAGCCAAGT  
558 P F G M Q G V G C H A S T T V A H L R T L R H L S L A H N N I S Q V  
2500 GTCCAGCAGCTTGCAGTACGCTGCTGCGGGCCCTGGACTTACGGGCAATGCACTGGCCATATGTGGCCGAGGGAGACTCTATCTGCACTTCTTC  
591 S Q Q L C S T S L R A L D F S G N A L G H M W A E G D L Y L H F F  
2600 CAAGGCTGAGCGTTTGTATGCTGGCTGGACTTGTCCAGAACCCCTGCACACCTCTGCCCAAACCTGGCAACCTCCCAAGAGCTTACAGGTGC  
625 Q G L S L I W L D L S Q N R L H T L L P Q T L R N L P K S L Q V  
2700 TGCCTCCGCTGACAATTACCTGGCCTTCTTAAAGTGGTGGAGCTCCACTTCTGCCAAACTGGAAGTCTCGACCTGGCAGGAAACAGCTGAAGGC  
658 L R L R D N Y L A F F K W W S L H F L P K L E V L D L A G N Q L K A  
2800 CCTGACCAATGGCAGCTCTGCTGCTGACACCCGCTCCGAGGCTGATGTCAGCTGCAACAGCATCAGCTTCTGGCCCGCTTCTTTTCAAAGGCC  
691 L T N G S L P A G T R L R R L D V S C N S I S F V A P G F F S K A  
2900 AAGGAGCTGCGAGCTCAACCTTAGCGCCAACCCCTCAAGACAGTGGACACTCTGGTGTGGCCCTGGCGAGTGCCTGCAAAATAGTAGTGTAA  
725 K E L R E L N L S A N A L K T V D H S W F G P L A S A L Q I L D V  
3000 GCGCAACCTCTGCACTGCGCTGTGGGGCGGCTTATGGACTTCTGCTGGAGGTGCAGGCTGCCGTGCCGGTCTGCCAGCCGGGTGAAGTGTGG  
758 S A N P L H C A C G A A F M D F L L E V Q A A V P G L P S R V K C G  
3100 CAGTCCGGCAGCTCAGGCGCTCAGCATCTTGCACAGGACTGCGCTTGGCTGGATGAGGCCCTCTCCTGGACTGTTTCCGCTCTCGCTGCTGCTG  
791 S P G Q L Q G L S I F A Q D L R L C L D E A L S W D C F A L S L L  
3200 GCTGTGGCTTGGCCTGGTGTGCCATGCTGCATCCTCTGTGGCTGGACCTTGGTACTGCTTCCACTGTGCTGGCCTGGCTTCCCTGGCGGG  
825 A V A L G L G V P M L H H L C G W D L W Y C F H L C L A W L P W R

BsrGI (3386)  
3300 GCGGCAAAATGGGCGAGATGAGGATGCCCTGCGCTACGATGCCTTCTGTGGTCTTCGACAAAACGAGAGCGAGTGGCAGACTGGGTGACAACGAGCT  
858 G R Q S G R D E D A L P Y D A F V V F D K T Q S A V A D W V Y N E L  
3400 TCGGGGCACTGGAGGAGTGCCTGGCGCTGGGCACTCCGCTGTGCTGGAGGAACGCACTGGCTGCCTGGCAAAACCTTGGAGAACCTGTGG  
891 R G Q L E E C R G R W A L R L C L E E R D W L P G K T L F E N L W

RsrII (3545) BssHII (3567)  
3500 GCCTCGTCTATGGCAGCCGCAAGACGCTGTTTGTGCTGGCCACAGGACGGGTCAAGTGGTCTCTTGGCGCCAGCTTCTGCTGGCCAGCAGCGCC  
925 A S V Y G S R K T L F V L A H T D R V S G L L R A S F L L A Q Q R

3600 TGCTGGAGGACCGCAAGGACGTCGTGGTGTGCTGCTGATCCTGAGCCCTGACGGCCGCCGCTCCCGTACGTGCGGCTGCGCCAGCGCCTCTGCCGCAGAG  
958▶ L L E D R K D V V V L V I L S P D G R R S R Y V R L R Q R L C R Q S  
3700 TGTCTCTCTGGCCCCACAGCCAGTGGTTCAGCGCAGCTTCTGGGCCAGCTGGGCATGGCCCTGACCCAGGGACAACCACCTTCTATAACCGGAAC  
991▶ V L L W P H Q P S G Q R S F W A Q L G M A L T R D N H H F Y N R N

Sa<sup>nd</sup>I (3807) NheI (3847)  
3800 TTCTGCCAGGGACCCACGGCCGAATAGCCGTGAGCCGGAATCCTGCACGCTAGCTGGCAGACATGATAAGATACATTGATGAGTTTGGACAAACACAA  
1025▶ F C Q G P T A E • P • A G I L H

HpaI (3985) MfeI (3985)  
3900 CTAGAATGCAGTGAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAAACCAAGTTAAACAACACAA  
4000 TTGCATTCATTTTATGTTTCAGGTTTCAGGGGGAGGTGTGGGAGGTTTTTAAAGCAAGTAAAACTCTACAATGTGGTATGGAATCTAAAATACAGCA  
4100 TAGCAAAACTTTAACCTCAAATCAAGCCTCTACTTGAATCCTTTCTGAGGGATGAATAAGGCATAGGCATCAGGGGCTGTTGCCAATGTGCATTAGCT  
4200 GTTTCAGCCTCACCTTCTTCATGGAGTTAAGATATAGTGATTTTCCCAAGGTTTGAAGTACTCTTCATTCTTTATGTTTTAAATGCACTGACCT

SspI (4320) SwaI (4334)  
4300 CCCACATTCCTTTTTAGTAAAAATTCAGAAATAATTTAAATACATCATTGCAATGAAAATAAATGTTTTTTATTAGGCAGAATCCAGATGCTCAAGGC  
4400 CCTTCATAATATCCCCAGTTTAGTAGTTGGACTTAGGGAACAAAGAACCTTTAATAGAATTGGACAGCAAGAAGCGAGCTTCTAGCGAATCTCGA

Scal (4552)  
4500 CTCATTCTTTGCCCTCGGACGAGTGTGGGGCGTGGTTTCCACTATCGCGGAGTACTTCTACACAGCCATCGGTCCAGACGGCCGGCTTCTCGGGC  
342▶ • E K A R P R T S P R R N G S D A L V E V C G D T W V A A S R R A  
4600 GATTTGTAGCGCCACAGTCCCGGATCGGACGATTCGTCGCATCGACCTCGCCCAAGCTGCATCATGAAATTCGGTCAACCAAGCTC  
309▶ I Q T R G V T G A G S R V I A D C R G Q A W A A D D F N G D V L S

SacII (4743)  
4700 TGATAGAGTTGGTCAAGACCAATCGGAGCATATACGCCGGACCGGGGATCTGCAAGCTCCGGATGCCTCGCTCGAAGTAGCGCTGTCTGTCT  
275▶ Q Y L Q D L G I R L M Y A R L R P S G A L E P H R R E F Y R T Q Q E  
4800 CCATACAAGCAACCACGGCTCCAGAGAAGATGTTGGGACCTCGTATTGGGAATCCCCGAACATCGCCTCGCTCCAGTCAATGACCCTGTTATGGC  
242▶ M C A L W P R W F F I N A V E Y Q S D G F M A E S W D I V A T I R  
4900 GCCATTGTCGTCAGGACATTGTTGGAGCCGAAATCCGCGTGCACGAGTTCGGGACCTCGGGGCAAGTCTCGCCCAAAGCATCAGCTCAGGAGCC  
209▶ G N D T L V N N S G F D A H V L H R V E P C D E A W L M L E D L A  
5000 TCGCGACGGACGCTGACGGTGTCTCCATCACAGTTTCCAGTGATACACATGGGATCAGCAATCGCGCATATGAAATCACGCCATGTAGTGATT  
175▶ Q A V S A S V T D D M V T Q W H Y V H P D A I A C I F D R W T T Y Q

RsrII (5112) PvuI (5159) SgfI (5158)  
5100 GACCGATTCTTTCGGTCCGAATGGGCGAACCCGCTCGTCTGGCTAAGATCGGCCGAGCGATCGCATCCATGAGCTCCGCGACGGTTGCAAGACAGC  
142▶ G I G Q P G F P G F G S T Q S L D A A A I A D M L E A V P Q L V A  
5200 GGGCAGTTCCGTTTCAGGCGGCTTTCGCAACGTCACCCCTGTGCACGGCGGAGATGCAATAGTTCAGGCTCTCGTGAATTCCTCAAGCATGTCAAGCAT  
109▶ P L E T E P L D Q L T V G Q A R R S I C Y T L S E S F E G I D L V  
5300 TCCGGAATCGGGAGCGCGCCGATGCAAAGTCCGATAAACATAACGATCTTTGTAGAACCATCGCGCAGCTATTACCCGAGGACATATCCACGCC  
75▶ E P I P L A A S A F H R Y V Y R D K Y F G D A C S N V R L V Y G R G

PshAI (5489) NruI (5489)  
5400 CTCCTACATCGAAGCTGAAAGCACGAGATTTCTCGCCCTCCGAGAGCTGCATCAGGTCCGAGACGCTGTGCAACTTTTCGATCAGAAACTTCGGACAGA  
42▶ G V D F S F A R S E E G E S L Q M L D S V S D F K E I L F K A V S

BspHI (5522) AseI (5580)  
5500 CGTCGCGGTGAGTTTCAGGCTTTTTCATGATGGCCCTCTATAGTGAGTCGATTATACATATGCCGATATACTATGCCGATGATTAATTGCAAAACACGCG  
9▶ T A T L E P K K M  
5600 TGGATGGCGTCTCCAGCTTATCTGACGGTTCACTAAACGAGCTCTGCTTATATAGACCTCCACCGTACACGCTACCGCCATTTGCGTCAATGGGGCG

SpeI (5735)  
5700 GAGTTGTTACGACATTTTGGAAAGTCCCGTTGATTACTAGTCAAAAACAACTCCATTGACGCTCAATGGGGTGGAGACTTGGAAATCCCCGTGAGTCAA

SnaBI (5863)  
5800 ACCGCTATCCACGCCATTGATGTAAGTCCAAAACCGCATCATCATGGTAATAGCGATGACTAATACGTAGATGTAAGTCCAAAGTAGGAAAGTCCATAA  
5900 GGTCATGTAAGTGGCATAATGCCAGCGGGCCATTTACCGTCAATGACGCTCAATAGGGGGCGTACTTGGCATATGATACACTTGTACTGCAAGTGG  
6000 GCAGTTTACCATAACTCCACCCATTGACGCTCAATGAAAGTCCCTATTGGCGTACTATGGAAACATACGTCATTATTGACGCTCAATGGGCGGGGT

SdaI (6146) PacI (6154) BspLU11I (6164)  
6100 CGTTGGGCGGTACGACAGCGGGCCATTTACCGTAAGTTATGTAACGCTGACGTTAATTAGAACATGTGAGCAAAAGCCAGCAAAAGGCCAGGAAC  
6200 CGTAAAAAGGCCGCTTGTGGCGTTTTCCATAGGCTCCGCCCTGACGAGCATCACAAAATCGACGCTCAAGTCAAGGTTGGCAAAACCCGACAG  
6300 GACTATAAGATACAGCGTTTTCCCTGGAAGTCCCTCGTGGCTCTCTGTTCCGACCTGCCGCTTACCGGATACCTGTCGCCCTTTCTCCCTTC  
6400 GGAAGCGTGGCGTTTCTCATAGCTACGCTGTAGGTATCTCAGTTCCGTTGAGGCTGTTGCTTCCGCTCAAGCTGGGCTGTGTGCACGAACCCCGTTTCA  
6500 CCCGACCGCTGCGCTTATCCGGTAACTATCGTCTTGTGCTCAACCCGGTAAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAAACAGGATTAGCA  
6600 GAGCGAGGTATGAGCGGTGCTACAGGTTCTTGAAGTGGTGGCTAACTACGCTACACTAGAAGACAGTATTGGTATCTGCGCTCTGCTGAAGCC  
6700 AGTTACCTTCGAAAAAGAGTTGGTAGCTCTTGTATCCGCAAAACAAACCCGCTGGTAGCGGTGTTTTTTTGTGCAAGCAGCAGATTACCGCAGA  
6800 AAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGTCTGACGCTCAGTGAACGAAAACCTCACGTTAAGGGATTTTGGTCATGGCTAGTTAAT  
6900 TAACTTTAATCA

Swal (6903) PacI (6894)