



1 GAGCTTGGCCATTGCATACGTTGTATCCATATCATAATATGTACATTTATATTGGCTCATGTCCAACATTACCGCATGTTGACATTGATTATTGACTA
101 GTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGTTACATAAATTACGGTAAATGGCCCGCTGGCTGACCGCC
201 CAACGACCCCGCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGATTTACGGTAA
301 ACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGGCATTATGCCAGTACA
401 TGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATA
501 GCGGTTTGACTCACGGGGATTCCAAGTCTCCACCCATTGACGTCAATGGGAGTTTGTGGTGGCACAAAATCAACGGGACTTTCCAAAATGTCGTAAC
601 AACTCCGCCCCATTGACGCAAATGGGCGGTAGGCGGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTGAACCGTCAGATCGCTGGAGACGCC
701 ATCCACGCTGTTTGGACTCCATAGAAGACACCGGGACCGATCCAGCTCCGGTCGACCGATCCTGAGAACTTCAGGgtgagtttggggacccttgattg
801 ttctttcttttctgctattgtaaaattcatgttatatggagggggcaaagttttcaggggtgtgtttagaatgggaagatgtcccttgtatcacctatgga
901 ccctcatgataattttgtttctttcactttctactctgttgacaaccattgtctctcttattttcttttcattttctgtaactttttcgttaaacttta
1001 gcttgcaatttgaacgaattttaaaattcacttttgtttatttgtcagattgtaagtactttctctaatcactttttttcaaggcaatcagggatatatt
1101 atattgtacttcagcacagtttttagagaacaattgttataatataatgataaggtagaatattttctgcatataaattctggctggcgtaggaatattctt
1201 attggtagaacaactacaccctggatcatcctgcctttctctttatggttacaatgatatacactgtttgagatgaggataaaatactctgagtgcca
1301 aaccgggcccctctgctaaccatgttcatgcctttctctttctctacagCTCCTGGCAACGTGCTGGTGTGTGCTGTCTCATATTTGGCAAAGA

Agel (1416)

T19I (1480)

Δ L24P25P26 +A27S

1401 ATTCTCGACGGATCCACCGGTCAACATGTTTGTGTTCTTGGTGTGCTTCCACTGGTCAGTTCCTCAATGCGTAAATCTC**ATC**ACCCGAAC**CAATCC**CTA
1501 TACAAATTCCTTACCAGAGGAGTGTACTATCTGACAAAGTGTTCGGTCAAGTGTCTCCACTCTACTCAGGACCTCTTCTCGCTTTCTTTTCTAAC
25▶ T N S F T R G V Y Y P D K V F R S S V L H S T Q D L F L P F F S N
1601 GTTACATGGTTTCATGCAATCTCTGGGACAAACGGCACAAACGCTTCGACAAACCCTGATTGCCATTCAATGATGGGTGTACTTTGCCTCCACAGAGA
59▶ V T W F H A I S G T N G T K R F D N P V L P F N D G V Y F A S T E
1701 AATCCAACATCATTGAGGATGGATTTTCGGGACTACTCTGGACTCAAAGACAGAGCCTGCTGATCGTTAAACAACGCCACAAACGTTGTCATCAAAGT
92▶ K S N I I R G W I F G T T L D S K T Q S L L I V N N A T N V V I K V
1801 GTGCGAATTCAGTTTTGCAATGATCCCTTCTG**GAC**GTGTACTATCACAAGAATAACAAGTCTGGATGGAGAGCGAATTTCCGGTCTACAGCAGCGCA
125▶ C E F Q F C N D P F L D V Y Y H K N N K S W M E S E F R V Y S S A
1901 AACAACTGCACCTTCGAGTACGTGAGTCAACCTTTCTGATGGACCTGGAAGGGAAACAGGAAACTTCAAGAACCTGAGAGAGTTTGTCTTTAAGAACA
159▶ N N C T F E Y V S Q P F L M D L E G K Q G N F K N L R E F V F K N
2001 TCGACGGCTATTTAAGATCTATAGTAAGCATAACGCTATCAACCTG**GGA**AGGGATCTTCCCAGGGCTTTTCAGCCCTGGAACCTTTGGTTGACTTGCC
192▶ I D G Y F K I Y S K H T P I N L G R D L P Q G F S A L E P L V D L P
2101 TATTGGTATCAATATCACCAGATTTTCAGACCTTCTGGCATTGCA**I**CGGTCTTATCTTACTCCAGTGATTCTCTCCGGTGGACTGCCGGCGCT
225▶ I G I N I T R F Q T L L A L H R S Y L T P G D S S S G W T A G A A
2201 GCCTACTATGTCGGCTATCTGCAACCAAGAAGTCTCTGCTCAAGTACAACGAAAACGGCACTATTACGGATGCTGTTGATTGTGCCCTGGACCCTCTGT
259▶ A Y Y V G Y L Q P R T F L L K Y N E N G T I T D A V D C A L D P L
2301 CTGAGACTAAATGCACCTCAAGAGCTTACCGTTGAGAAGGGGATTACCAAACAGTAATTTCCGGGTCCAACCCACGAAAGCATTGTGCGGTTCCC
292▶ S E T K C T L K S F T V E K G I Y Q T S N F R V Q P T E S I V R F P

G339D (2425)

R346T (2446)

2401 AAATATCACCAATCTGTGTCCTTT**GAT**GAAGTGTTCATGCTACA**ACC**TTTGCTTCTGTGTACGCATGGAATAGGAAACGCATCTCCAATTTGTGTCGT
325▶ N I T N L C P F D E V F N A T T F A S V Y A W N R K R I S N C V A

T376A (2536)

S373P (2527)

S371F (2521) S375F (2533)

2501 GATTACTCCGTGCTGTACAAT**TTT**GCC**CCA**TT**TT**CGCTTTCAAGTGTATGGCGTTTACCTACCAAACCTAACGACCTGTGCTTCACTAATGTGTATG
359▶ D Y S V L Y N F A P F F A F K C Y G V S P T K L N D L C F T N V Y

R408S (2632)

D405N (2623)

K417N (2659)

2601 CCGACTCTTTTGTGATACGAGGC**AAI**GAAGT**GAG**CCAGATTGCACCGGGCAGACCGGC**AA**ATTGCCGACTACAAC**TACA**AGCTTCCAGATGACTTTAC
392▶ A D S F V I R G N E V S Q I A P G Q T G N I A D Y N Y K L P D D F T

2701 CGGATGTGTTATTGCATGGAACCTCAAAC**AAG**CTGGATTCC**ACC**GTGGGTGGCAACTATAACTAC**AGA**TATAGACTGTTCCAGGAAATCC**AAG**CTGAAACCA
425▶ G C V I A W N S N K L D S T V G G N Y N Y R Y R L F R K S K L K P

2801 TTCGAGCGAGATATAAGCACAGAAATCTACCAGGCTGGAA**ACAAA**CCCTGCAACGGCGT**GCT**GGG**GTG**AACTGCTACTTCCCATTG**CAG**AGTTACGGAT
459▶ F E R D I S T E I Y Q A G N K P C N G V A G V N C Y F P L Q S Y G

2901 TC**AGA**CTACAT**TAC**GGGGTGGGT**CAC**CAACCTATCGTGTCTGAGTCTTGGAGTCTTCCATGCCCCAGCCACAGTCTGTGGCCCCAAGAAAAG
492▶ F R P T Y G V G H Q P Y R V V V L S F E L L H A P A T V C G P K K S

3001 CACCAATCTGGTGAAGAACAAATGCGTGAACCTTAACTTTAACGGACTCACAGGAACCGGCGTATTGACGGAGAGTAACAAGAAGTCTGCCATTCCAG
525▶ T N L V K N K C V N F N F N G L T G T G V L T E S N K K F L P F Q

3101 CAGTTCGGTCCGATATTGCCGACACTACCGACGCTGTCCGAGATCCCCAGACATTGGAGATTCTTGATATCACACCTGTAGTTTCGGCGGAGTGAGCG
559▶ Q F G R D I A D T T D A V R D P Q T L E I L D I T P C S F G G V S

3201 TGATTACGCCCGAAACCAATACCAGCAATCAGGTTGCCGCTGTATCAG**GGC**GTGAATTGCACCGAGGTACTGTGCCATCCACGCTGACCAACTAC
592▶ V I T P G T N T S N Q V A V L Y Q G V N C T E V P V A I H A D Q L T

3301 ACCCACATGGCGAGTATATTCCACCGCTCCAACGTCTTTCAGACACGTGCTGGATGTCTGATCGGTGCAGAA**TAI**GTTAATAATAGCTACGAGTGTGAT
625▶ P T W R V Y S T G S N V F Q T R A G C L I G A E Y V N N S Y E C D

3401 ATCCCCATCGGTGCTGGAATATGCGCCTCTTATCAAACCTCAAAC**AAA**TCT**CAC**AGCGGGCA**CGTAGT**GTAGCATCCCAAAGTATCATTGCCTACACAA
659▶ I P I G A G I C A S Y Q T Q T K S H R R A R S V A S Q S I I A Y T
3501 TGAGCCTCGGTGCTGAGAATTCTGTCGCTACAGCAACCACTCATTGCTATCCCTACTAACTTACAATCAGTGTGACAACCTGAAATCTGCCCGTATC
692▶ M S L G A E N S V A Y S N N S I A I P T N F T I S V T T E I L P V S
3601 TATGACCAAAAAGCGTTGACTGCACCATGTACATCTGTGGCGATTCTACCGAATGTAGCAATCTCCTCCTGCAATACGGATCATTCTGACTCAGCTG
725▶ M T K T S V D C T M Y I C G D S T E C S N L L L Q Y G S F C T Q L

3701 **AAG**CGTGCCTCACAGTATTGCAGTTGAGCAGGACAAGAATACGCAGGAAGTGTTCGCCAGGTGAAGCAATCTACAAAACCTCCACCCATAAAA**TAC**T
759▶ K R A L T G I A V E Q D K N T Q E V F A Q V K Q I Y K T P P I K Y
3801 TTGGCGGATCAATTTCTCACAGATCTGCCGATCCCTCAAACCTCAAAGCGTAGCTTTATCAGGATCTGCTCTTCAACAAGGTAACCTCGCAGA
792▶ F G G F N F S Q I L P D P S K P S K R S F I E D L L F N K V T L A D
3901 TGCCGGTTTCATCAAGCAGTATGGCGATTGTCTGGGAGACATCGCCGCTCGGGACCTGATCTGTGCACAGAAGTTCAATGGACTGACCGTGCCTCCC
825▶ A G F I K Q Y G D C L G D I A A R D L I C A Q K F N G L T V L P P
4001 TTGCTGACCGACGAGATGATAGCCCAATACACTAGCGCCTGCTGGCCGCCACCATCACTTCTGGGTGGACATTGGAGCTGGCGCTGCCCTTCAAGTTC
859▶ L L T D E M I A Q Y T S A L L A G T I T S G W T F G A G A A L Q I
4101 CTTTTGCTATGAGATGGCCTACCGCTTAAACGGCATTGGTGTGACACAAAACGTTCTGTATGAAAACAGAACTCATCGCAACAGTTCAACAGTGC
892▶ P F A M Q M A Y R F N G I G V T Q N V L Y E N Q K L I A N Q F N S A

4201 TATCGGTAAGATACAGGATAGCTGTATCCACTGCCAGCGCATTGGGAAAGTTGCAGGATGTAGTGAAC**CACA**ATGCCAGGCACCTTAACACCCTGGTG
925▶ I G K I Q D S L S S T A S A L G K L Q D V V N H N A Q A L N T L V

4301 AAACAGCTCTCTTCA**AAG**TTTTGGTGCCATTTCTAGCGTGTGAATGACATACTGAGCCGTTGGACAAGGTGGAGGCTGAAGTGCAGATTGATAGGCTGA
959▶ K Q L S S K F G A I S S V L N D I L S R L D K V E A E V Q I D R L
4401 TAACTGGGCGCCTTCACTCTCTCAGACCTATGTGACCCAGCAGCTATCCGCGTCTGAAATTCGCGCATCCGCTAACCTGGCAGCAACCAAAATGTC
992▶ I T G R L Q S L Q T Y V T Q Q L I R A A E I R A S A N L A A T K M S
4501 CGAGTGTGTGCTGGGTGAGTCTAAGAGAGTGGACTTTTGGCGGAAGGGGATCACCTGATGTCTTTTCTCAGTCTGCACCCCATGGTGTGGTCTTTCTG
1025▶ E C V L G Q S K R V D F C G K G Y H L M S F P Q S A P H G V V F L
4601 CACGTGACTTATGCCAGCTCAGGAAAAGAACTTCACTACAGCCCAGCCATCTGCCACGATGGGAAAGCCACTTCCCAGGGAAGGCGTATTCGTGT
1059▶ H V T Y V P A Q E K N F T T A P A I C H D G K A H F P R E G V F V
4701 CCAATGGTACTCATTGGTTCTGCTCACTCAGAGAAATTTCTACGAGCCCCAGATTATAACCACTGACAATACATTTGTATCCGGCAATTTGTGATGTGGTTAT
1092▶ S N G T H W F V T Q R N F Y E P Q I I T T D N T F V S G N C D V V I
4801 CGGGATTGTGAATAACTGTTTACGATCCTTTGACCCAGAGCTGGACTCTTCAAGGAGGAGCTTGACAAATATTTAAGAATCACACATCACCTGAC
1125▶ G I V N N T V Y D P L Q P E L D S F K E E L D K Y F K N H T S P D
4901 GTCGACCTCGGAGATATTTAGGAATCAATGCTTCCGTGGTCAATATTGAGAAGGAGATAGACAGGCTGAATGAGGTTGCCAAGAACCTCAACGAGTCTC
1159▶ V D L G D I S G I N A S V V N I Q K E I D R L N E V A K N L N E S
5001 TGATCGATCTGCAGGAGTTGGGCAAGTACGAACAGTATATCAAATGGCC**IT**TGGTACATTTGGCTTGGGTTTATTGCTGGGCTGATAGCTATCGTCATTGGT
1192▶ L I D L Q E L G K Y E Q Y I K W P W Y I W L G F I A G L I A I V M V

5101 GACAATTATGTTGTGTTGCATGACATCTGCTGTAGTTGTCTGAAGGGCTGCTGCTCATCGCGCAGCTGTTGCTAAAGCTAGCCTCGAGGGATCCGTCGA
1225▶ T I M L C C M T S C C S C L K G C C S C G S C C •

5201 GGAATCACT**CCTCAGGTGCAGGCTGCCTATCAGAAGTGGTGGTGGTGGCCAAATGCCCTGGCTCACAATAACCACTGAGATCTTTTTCCCTCTGCC**

5301 **AAAAATATGGGGACATCATGAAGCCCTTGAGCATCTGACTTCTGGCTAATAAAGGAAATTTATTTTCATTGCAATAGTGTGTTGGAATTTTTGTGTC**

5401 TCTCACTCGGAAGGACATATGGGAGGGCAAATCATTTAAAACATCAGAATGAGTATTTGGTTAGAGTTTGGCAACATATGCCATATGCTGGCTGCCAT
5501 GAACAAAGGTTGGCTATAAAGAGGTCATCAGTATATGAAACAGCCCCCTGCTGTCCATTCTTATTCCATAGAAAAGCCTTGACTTGAGGTTAGATTTT
5601 TTTATATTTTGTGGTTATTTTTTTCTTTAACATCCCTAAAATTTTCTTACATGTTTTACTAGCCAGATTTTTCTCTCTCTGACTACTCCAG
5701 TCATAGCTGTCCCTTCTCTTATGGAGATCCCTCGACGGATCGGCCAATTGTAATCATGTCATAGCTGTTTCTGTGTGAAATTGTTATCCGCTCA
5801 CAATTCACACACACATACGAGCCGGAAGCATAAAGTGTAAGCCTGGGGTGCCTAATGAGTGAGCTAACTCACATTAATTGCGTTGCGCTCACTGCCCGC
5901 TTTCCAGTCGGGAAACCTGTCTGTCCAGCTGCATTAATGAATCGGCCAACGCGGGGAGAGCGGTTTTCGTATTGGGCGCTCTCCGCTTCTCGCTC
6001 ACTGACTCGCTGCGCTCGGTCGTTCCGGTCTGGCGGAGCGGTATCAGCTCACTCAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAA
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6201 AAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCTGGAAGCTCCCTCGTGCCTCTCTGTTCCGACC
6301 CTGCCGTTACCGGATACCTGTCCGCTTTCTCCCTTCGGGAAGCGTGGCGTTTTCTCATAGCTCACGCTGATAGGTATCTCAGTTCGGGTAGGTCGTTT
6401 GCTCCAAGCTGGGCTGTGTGCACGAACCCCCGTTACGCCCACCGCTGCGCTTATCCGGTAACTATCGTCTTGAAGTGGTGGCCTAACTACGGCTACACT
6501 ATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACT
6601 AGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCG
6701 GTGGTTTTTTTTGTTTGAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGAACGA
6801 AAATCACGTTAAGGGATTTTGGTCATGAGATTATCAAAAAGGATCTTACCTAGATCCTTTAAATTAATAAAGTGTAAATCAATCTAAAGTATA
6901 TATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTGTCTATTTGCTTATCCATAGTTGCCTGACTCCCCG
7001 TCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGTGTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGCAAT
261 T Y I V V I R S P K G D P G L A A I I G R S G R E G A G S K D A I
7101 AAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCTGCACTTTATCCGCTCCATCAGTCTATTAATTGTTGCCGGGAAGCTAGAGTAAGTAGT
228 F W G A P L A S R L L P G A V K D A E M W D I L Q Q R S A L T L L
7201 TCGCCAGTTAATAGTTTGGCGAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTACAGCTCGTCTGTTGGTATGGCTTATTGCTCAGCTCCGGTCCCAAC
194 E G T L L K R L T T A M A V P M T D R E D N P I A E N L E P E W R
7301 GATCAAGGCGAGTTACATGATCCCCATGTTGTGCAAAAAAGCGTTAGCTCCTTCGGTCTCCGATCGTTGTGAGAAAGTGGCCGCAAGTGTATC
161 D L R T V H D G M N H L F A T L E K P G G I T T L L L N A A T N D
7401 ACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGGTACTCAACCAAGTATTCTGAGAA
128 S M T I A A S C L E R V T M G D T L H K E T V P S Y E V L D N Q S
7501 TAGTGTATGCGGCGACCGAGTTGCTCTTGCCTGGCGTCAATACGGGATAATACCGCGCCACATAGCAGAACTTAAAAGTGTCTATCATTGAAAAAGTT
94 Y H I R R G L Q E Q G A D I R S L V A G C L L V K F T S M M P F R E
7601 CTTGGGGGCAAAACTCTCAAGGATCTTACCGCTGTGAGATCCAGTTCGATGTAACCCACTCGTGCACCAACTGATCTTACGATCTTTACTTTTCA
61 E P R F S E L I K G S N L D L E I Y G V R A G L Q D E A D K V K V
7701 CAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTTCTTTTTCAA
28 L T E P H A F V P L C F A A F F P I L A V R F H Q I S M
7801 TATTATTGAAGCATTATCAGGGTATTGTCTCATGAGCGGATACATATTTGAATGATTTAGAAAAATAACAAATAGGGGTTCCGCGCACATTTCCCC
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8001 AAAATCCCTTATAAATCAAAAGAATAGACCGAGATAGGGTTGAGTGTGTTCCAGTTTGAACAAGAGTCCACTATTAAGAAGCTGGACTCCAACGTCA
8101 AAGGGGCAAAAACCGTCTATCAGGGCGATGGCCACTACGTGAACCATCACCTAATCAAGTTTTTGGGGTGCAGGTGCCGTAAAGCACTAAATCGGAA
8201 CCCTAAAGGGAGCCCCGATTAGAGCTTGACGGGGAAAGCCGGCGAACGTGGCGAGAAAGGAAGGAAAGAAAGCGAAAGGAGCGGGCGTAGGGCGCTG
8301 GCAAGTGTAGCGGTCACGCTGCGCGTAACCACACACCCCGCGCTTAATGCGCGCTACAGGGCGGCTCCCATTCGCCATTGAGGCTGCGCAACTGTT
8401 GGGAAAGGGGATCGGTGCGGGCTTTCGCTATTACGCCAGCTGGCGAAAGGGGATGTGCTGCAAGGCGATTAAGTTGGGTAACGCCAGGGTTTTCCCA
8501 GTCACGACGTTGTAACGACGGCCAGTGAGCGCGGTAATACGACTCACTATAGGGCAATTGGAGCTCCACCGCGGTGGCGGCCGCTCTAGA