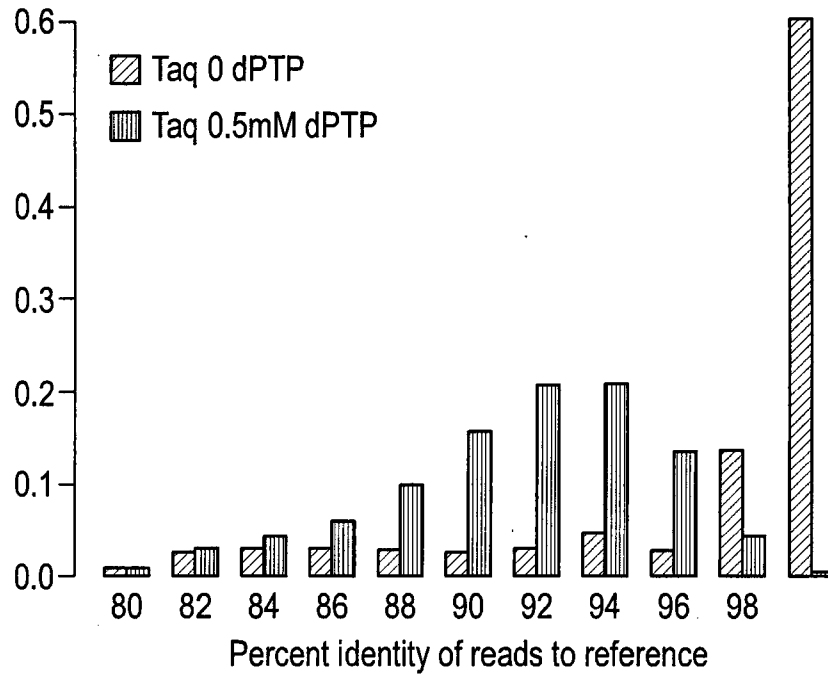


Figure 1

Panel A:



Panel B:

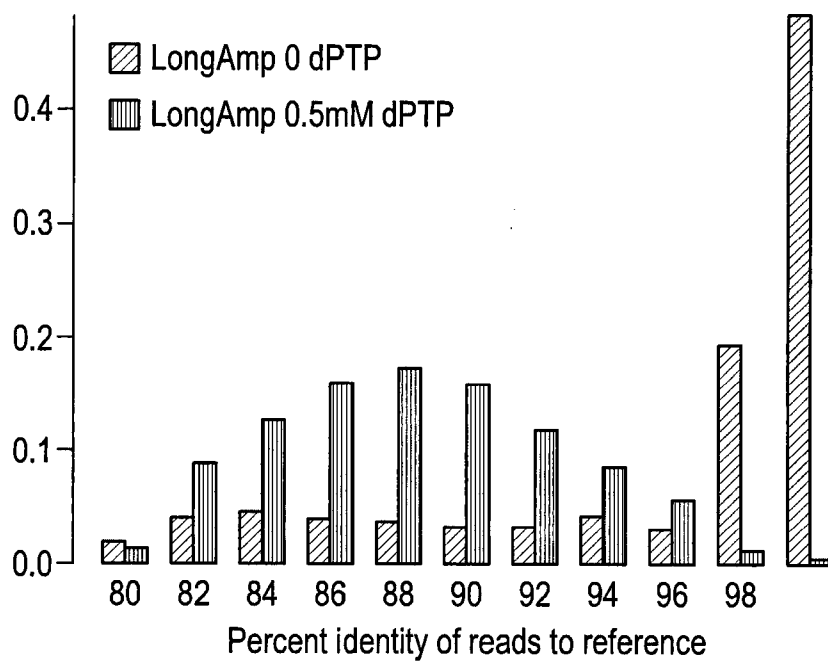


Figure 1 (Cont.)

Panel C:

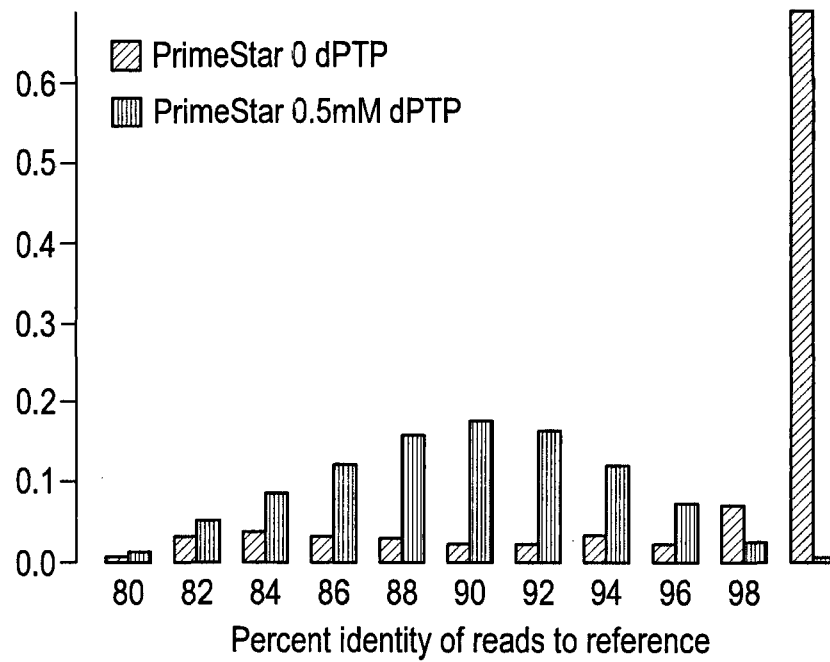


Figure 2

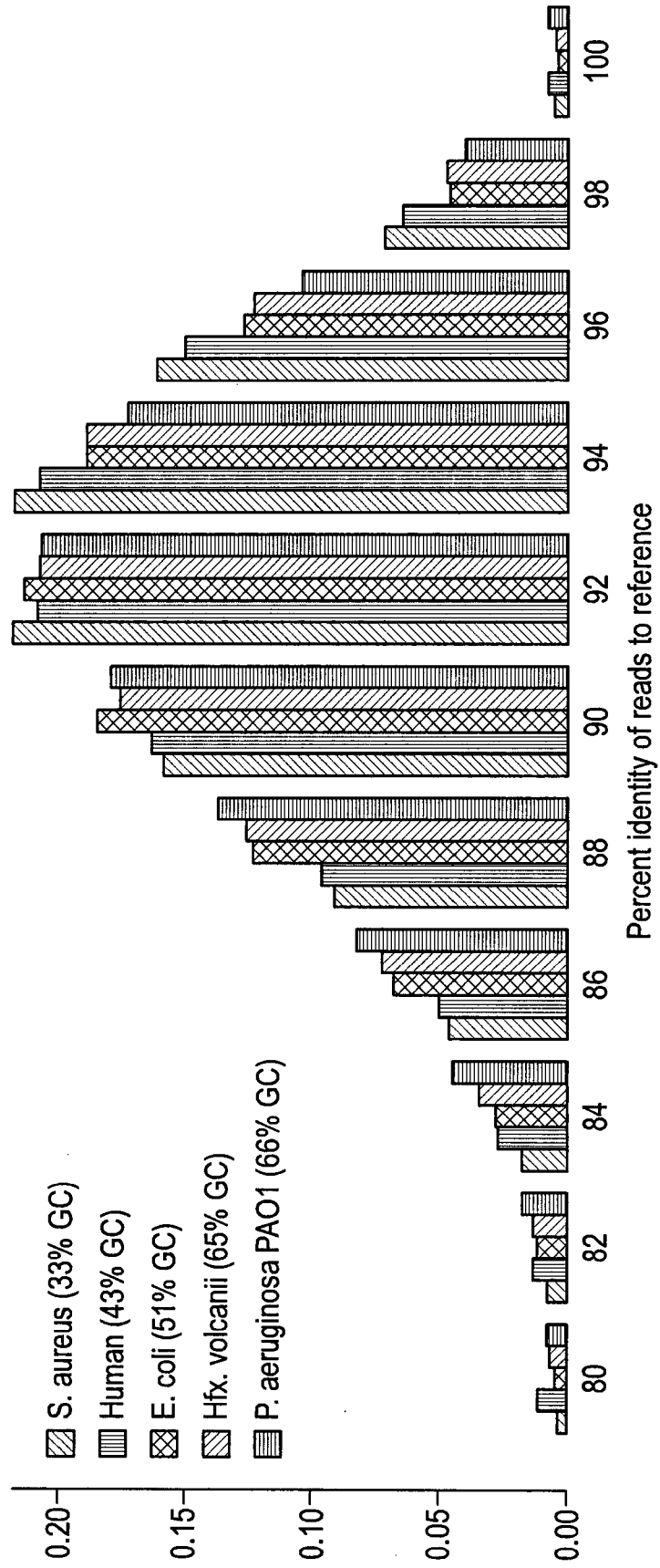


FIGURE 3

SEQ ID NO: 1 – nucleotide sequence of DNA polymerase from *Thermococcus* sp. KS-1

```

atgatcctcg acactgacta cataactgag aatggaaaac ccgtcataag gatthttcaag
aaggagaacg gcgagtttaa gattgagtag gataggactt ttgaacccta cattttacgcc
ctcctgaagg acgattctgc cattgaggag gtcaagaaga taaccgccga gaggcacgga
acggttgtaa cggttaagcg ggctgaaaag gttcagaaga agttcctcgg gagaccagtt
gagggtctgga aactctactt tactcacctt caggacgtcc cagcgataag ggacaagata
cgagagcatc cagcagttat tgacatctac gagtacgaca tacccttcgc caagcgctac
ctcatagaca agggattagt gccaatggaa ggcgacgagg agctgaaaat gcttgccctt
gatatcgaga cgctctacca tgaggcgag gagttcgccg aggggccaat ccttatgata
agctacgccg acgaggaagg ggccagggtg ataactgga agaactcgga tctgccttac
gttgacgtcg tctcgacgga gaggagatg ataaagcgct tcctaaagggt ggtcaaagag
aaagatcctg acgtcctaata aactacaac ggcgacaact tcgacttcgc ctactaaaa
aaacgtgtg aaaagcttgg aataaacttc acgtcggaa gggacggaag cgagccgaag
attcagagga tggcgacag gtttgccgtc gaagtgaagg gacggataca cttcgatctc
tattctgtga taagacggac gataaacctg cccacataca cgcttgaggc cgtttatgaa
gccgtcttcg gtcagccgaa ggagaaggtc tacgtgagg agatagctac agcttgggag
agcgggtgaag gccttgagag agtagccaga tactcgatgg aagatgcgaa ggtcacatac
gagcttggga aggagttttt ccctatggag gccagcttt ctcgcttaat cggccagttc
ctctgggacg tctcccgtc cagcactggc aacctcgttg agtggttcct cctcaggaag
gcctacgaga ggaatgagct ggccccgaac aagcccgatg aaaaggagct ggccagaaga
cgacagagct atgaaggagg ctatgtaaaa gagcccgaga gaggggtgtg ggagaacata
gtgtacctag atttttagatc tctgtacccc tcaatcatca tccccacaa cgtctcgccg
gatactctca acaggaagg atgcaaggaa tatgacgttg cccccagggt cggtcaccgc
ttctgcaagg acttcccagg atttatcccg agcctgcttg gagacctcct agaggagagg
cagaagataa agaagaagat gaaggccacg attgaccgga tcgagaggaa gctcctcgat
tacaggcaga gggccatcaa gatcctggcc aacagctact acggttacta cggctatgca
agggcgcgct ggtactgcaa ggagtgtgca gagagcgtaa cggcctgggg aaggagtag
ataacgatga ccatcagaga gatagaggaa aagtacggct ttaaggtaat ctacagcgac
accgacggat tttttgccac aatacctgga gccgatgctg aaaccgtcaa aaagaaggcg
atggagttcc tcaagtatat caacgcaaaa ctcccggggc cgcttgagct cgagtacgag
ggcttctaca aacgcggctt cttcgtcacg aagaagaagt acgcgggtgat agacgaggaa
ggcaagataa caacgcgcgg acttgagatt gtgaggcgcg actggagcga gatagcga
gagacgcagg cgagggttct tgaagctttg ctaaaggacg gtgacgtcga gaaggccgtg
aggatagtca aagaagttac cgaaaagctg agcaagtacg aggttccgcc ggagaagctg
gtgatccacg agcagataac gagggattta aaggactaca aggcaaccgg tccccacgtt
gccgttgcca agaggttggc cgcgagagga gtcaaaatac gccctggaac ggtgataagc
tacatcgtgc tcaagggtc tgggaggata ggcgacaggc cgataccgtt cgacgagttc
gacccgacga agcacaagta cgacgccgag tactacattg agaaccagggt tctcccagcc
gttgagagaa ttctgagagc cttcggttac cgcaaggaa acctgcgcta ccagaagacg
agacaggttg gtctgggagc ctggctgaag ccgaaggaa cttga

```

SEQ ID NO: 2 – polypeptide sequence of DNA polymerase from *Thermococcus* sp. KS-1

Met Ile Leu Asp Thr Asp Tyr Ile Thr Glu Asn Gly Lys Pro Val Ile
 Arg Ile Phe Lys Lys Glu Asn Gly Glu Phe Lys Ile Glu Tyr Asp Arg
 Thr Phe Glu Pro Tyr Ile Tyr Ala Leu Leu Lys Asp Asp Ser Ala Ile
 Glu Glu Val Lys Lys Ile Thr Ala Glu Arg His Gly Thr Val Val Thr
 Val Lys Arg Ala Glu Lys Val Gln Lys Lys Phe Leu Gly Arg Pro Val
 Glu Val Trp Lys Leu Tyr Phe Thr His Pro Gln Asp Val Pro Ala Ile
 Arg Asp Lys Ile Arg Glu His Pro Ala Val Ile Asp Ile Tyr Glu Tyr
 Asp Ile Pro Phe Ala Lys Arg Tyr Leu Ile Asp Lys Gly Leu Val Pro
 Met Glu Gly Asp Glu Glu Leu Lys Met Leu Ala Phe Asp Ile Glu Thr
 Leu Tyr His Glu Gly Glu Glu Phe Ala Glu Gly Pro Ile Leu Met Ile
 Ser Tyr Ala Asp Glu Glu Gly Ala Arg Val Ile Thr Trp Lys Asn Ala
 Asp Leu Pro Tyr Val Asp Val Val Ser Thr Glu Arg Glu Met Ile Lys
 Arg Phe Leu Lys Val Val Lys Glu Lys Asp Pro Asp Val Leu Ile Thr
 Tyr Asn Gly Asp Asn Phe Asp Phe Ala Tyr Leu Lys Lys Arg Cys Glu
 Lys Leu Gly Ile Asn Phe Thr Leu Gly Arg Asp Gly Ser Glu Pro Lys
 Ile Gln Arg Met Gly Asp Arg Phe Ala Val Glu Val Lys Gly Arg Ile
 His Phe Asp Leu Tyr Pro Val Ile Arg Arg Thr Ile Asn Leu Pro Thr
 Tyr Thr Leu Glu Ala Val Tyr Glu Ala Val Phe Gly Gln Pro Lys Glu
 Lys Val Tyr Ala Glu Glu Ile Ala Thr Ala Trp Glu Ser Gly Glu Gly
 Leu Glu Arg Val Ala Arg Tyr Ser Met Glu Asp Ala Lys Val Thr Tyr
 Glu Leu Gly Lys Glu Phe Phe Pro Met Glu Ala Gln Leu Ser Arg Leu
 Ile Gly Gln Ser Leu Trp Asp Val Ser Arg Ser Ser Thr Gly Asn Leu
 Val Glu Trp Phe Leu Leu Arg Lys Ala Tyr Glu Arg Asn Glu Leu Ala
 Pro Asn Lys Pro Asp Glu Lys Glu Leu Ala Arg Arg Arg Gln Ser Tyr
 Glu Gly Gly Tyr Val Lys Glu Pro Glu Arg Gly Leu Trp Glu Asn Ile
 Val Tyr Leu Asp Phe Arg Ser Leu Tyr Pro Ser Ile Ile Ile Thr His
 Asn Val Ser Pro Asp Thr Leu Asn Arg Glu Gly Cys Lys Glu Tyr Asp
 Val Ala Pro Gln Val Gly His Arg Phe Cys Lys Asp Phe Pro Gly Phe
 Ile Pro Ser Leu Leu Gly Asp Leu Leu Glu Glu Arg Gln Lys Ile Lys
 Lys Lys Met Lys Ala Thr Ile Asp Pro Ile Glu Arg Lys Leu Leu Asp
 Tyr Arg Gln Arg Ala Ile Lys Ile Leu Ala Asn Ser Tyr Tyr Gly Tyr
 Tyr Gly Tyr Ala Arg Ala Arg Trp Tyr Cys Lys Glu Cys Ala Glu Ser
 Val Thr Ala Trp Gly Arg Glu Tyr Ile Thr Met Thr Ile Arg Glu Ile
 Glu Glu Lys Tyr Gly Phe Lys Val Ile Tyr Ser Asp Thr Asp Gly Phe
 Phe Ala Thr Ile Pro Gly Ala Asp Ala Glu Thr Val Lys Lys Lys Ala
 Met Glu Phe Leu Lys Tyr Ile Asn Ala Lys Leu Pro Gly Ala Leu Glu
 Leu Glu Tyr Glu Gly Phe Tyr Lys Arg Gly Phe Phe Val Thr Lys Lys
 Lys Tyr Ala Val Ile Asp Glu Glu Gly Lys Ile Thr Thr Arg Gly Leu
 Glu Ile Val Arg Arg Asp Trp Ser Glu Ile Ala Lys Glu Thr Gln Ala
 Arg Val Leu Glu Ala Leu Leu Lys Asp Gly Asp Val Glu Lys Ala Val
 Arg Ile Val Lys Glu Val Thr Glu Lys Leu Ser Lys Tyr Glu Val Pro
 Pro Glu Lys Leu Val Ile His Glu Gln Ile Thr Arg Asp Leu Lys Asp
 Tyr Lys Ala Thr Gly Pro His Val Ala Val Ala Lys Arg Leu Ala Ala
 Arg Gly Val Lys Ile Arg Pro Gly Thr Val Ile Ser Tyr Ile Val Leu
 Lys Gly Ser Gly Arg Ile Gly Asp Arg Ala Ile Pro Phe Asp Glu Phe
 Asp Pro Thr Lys His Lys Tyr Asp Ala Glu Tyr Tyr Ile Glu Asn Gln
 Val Leu Pro Ala Val Glu Arg Ile Leu Arg Ala Phe Gly Tyr Arg Lys
 Glu Asp Leu Arg Tyr Gln Lys Thr Arg Gln Val Gly Leu Gly Ala Trp
 Leu Lys Pro Lys Gly Thr

SEQ ID NO: 3 – nucleic acid sequence of DNA polymerase from *Thermococcus celer*

```

atgatcctcg acgctgacta catcaccgaa gatgggaagc ccgtcgtgag gatattcagg
aaggagaagg gcgagttcag aatcgactac gacagggact tcgagcccta catctacgcc
ctcctgaagg acgattcggc catcgaggag gtgaagagga taaccgttga gcgccacggg
aaggccgtca gggttaagcg ggtggagaag gtcgaaaaga agttcctcaa caggccgata
gaggctctga agctctactt caatcacccg caggacgttc cggcgataag ggacgagata
aggaagcatc cggccgtcgt tgatatctac gagtacgaca tcccccttcgc caagcgctac
ctcatcgata aggggctcgt cccgatggag ggggaggagg agctcaaact gatggccttc
gacatcgaga ccctctacca cgagggagac gagttcgggg aggggcccgat cctgatgata
agctacgccg acggggacgg ggcgagggtc ataacctgga agaagatcga cctccccctac
gtcgacgtcg tctcgaccga gaaggagatg ataaagcgct tcctccagggt ggtgaaggag
aaggaccgag acgtgctcgt aacttacaac ggcgacaact tcgacttcgc ctacctgaag
agacgctccg aggagcttgg attgaagttc atcctcggga gggacgggag cgagcccaag
atccagcgca tgggcgaccg cttcgccgtc gaggtgaagg ggaggataca cttcgacctc
tacccggtga taaggcgcac cgtgaacctg ccgacctaca cgctcgaggc ggtctacgag
gccatcttcg ggaggccaaa ggagaaggtc tacgcggggg agatagtgga ggctgggaa
accggcgagg gtcttgagag ggttgcccgc tactccatgg aggacgcaaa ggttaccttc
gagctcggga gggagttctt cccgatggag gccagctct cgaggctcat cggccagggt
ctctgggacg tctcccgtc gagcaccggc aacctggtcg agtggttcct cctgaggaag
gcctacgaga ggaacgaact ggccccgaac aagccgagcg gccgggaagt ggagatcagg
agggcgtggc acgccgggtg ttacgttaag gagccggaga ggggtttatg ggagaacatc
gtgtacctcg acttctcgtc tctttacccc tccatcatca taaccacaa cgtctcgccc
gataccctaa acagggaggg ctgtgagaac tacgacgtcg cccccagggt ggggcataag
ttctgcaaag attttccggg cttcatcccg agcctgctcg gaggcctgct tgaggagagg
cagaagataa agcggaggat gaaggcctct gtggatcccg ttgagcggaa gctcctcgat
tacaggcaga gggccatcaa gatactggcc aacagcttct acggatacta cggctacgcg
agggcgagggt ggtactgcag ggagtgcgcg gagagcgtaa ccgcctgggg cagggagtac
atcgataggg tcatcaggga gctcgaggag aagttcggct tcaagggtgct ctacgcggac
acggacggac tgcacgccac gatccccggg gcggacgccg ggaccgtcaa ggagagggcg
aggggggtcc tgagatacat caacccaag ctccccggcc tcctggagct cgagtacgag
gggttctacc tgaggggttt cttcgtgacg aagaagaagt acgcggtcac agacgaggag
ggcaagataa ccacgcgcgg cctcgagata gtcaggcggg actggagcga ggtggccaag
gagacgcagg cgagggtcct ggaggcgata ctgaggcacg gtgacgtcga ggaggccgtt
agaatcgtca gggaggtaac cgaaaagctg agcaagtacg aggttccgcc ggagaaactg
gtgatccacg agcagataac gagggatttg agggactaca aagccacggg accgcacgtg
gcggtggcga agcgcctggc cgggaggggg gtaaggatac gccccgggac ggtgataagc
tacatcgtcc tcaagggtc cggaaggata ggggacaggg cgattccctt cgacgagttc
gacccgacta agcacaggta cgacgccgac tactacatcg agaaccagggt tctgccagcc
gtcgagagga tcctgaaggc cttcggctac cgcaaggagg acctgaaata ccagaagacg
aggcagggtg gcctgggtgc gtggtcaac gcggggaagg ggtga

```

SEQ ID NO: 4 – polypeptide sequence of DNA polymerase from *Thermococcus celer*

Met Ile Leu Asp Ala Asp Tyr Ile Thr Glu Asp Gly Lys Pro Val Val
 Arg Ile Phe Arg Lys Glu Lys Gly Glu Phe Arg Ile Asp Tyr Asp Arg
 Asp Phe Glu Pro Tyr Ile Tyr Ala Leu Leu Lys Asp Asp Ser Ala Ile
 Glu Glu Val Lys Arg Ile Thr Val Glu Arg His Gly Lys Ala Val Arg
 Val Lys Arg Val Glu Lys Val Glu Lys Lys Phe Leu Asn Arg Pro Ile
 Glu Val Trp Lys Leu Tyr Phe Asn His Pro Gln Asp Val Pro Ala Ile
 Arg Asp Glu Ile Arg Lys His Pro Ala Val Val Asp Ile Tyr Glu Tyr
 Asp Ile Pro Phe Ala Lys Arg Tyr Leu Ile Asp Lys Gly Leu Val Pro
 Met Glu Gly Glu Glu Glu Leu Lys Leu Met Ala Phe Asp Ile Glu Thr
 Leu Tyr His Glu Gly Asp Glu Phe Gly Glu Gly Pro Ile Leu Met Ile
 Ser Tyr Ala Asp Gly Asp Gly Ala Arg Val Ile Thr Trp Lys Lys Ile
 Asp Leu Pro Tyr Val Asp Val Val Ser Thr Glu Lys Glu Met Ile Lys
 Arg Phe Leu Gln Val Val Lys Glu Lys Asp Pro Asp Val Leu Val Thr
 Tyr Asn Gly Asp Asn Phe Asp Phe Ala Tyr Leu Lys Arg Arg Ser Glu
 Glu Leu Gly Leu Lys Phe Ile Leu Gly Arg Asp Gly Ser Glu Pro Lys
 Ile Gln Arg Met Gly Asp Arg Phe Ala Val Glu Val Lys Gly Arg Ile
 His Phe Asp Leu Tyr Pro Val Ile Arg Arg Thr Val Asn Leu Pro Thr
 Tyr Thr Leu Glu Ala Val Tyr Glu Ala Ile Phe Gly Arg Pro Lys Glu
 Lys Val Tyr Ala Gly Glu Ile Val Glu Ala Trp Glu Thr Gly Glu Gly
 Leu Glu Arg Val Ala Arg Tyr Ser Met Glu Asp Ala Lys Val Thr Phe
 Glu Leu Gly Arg Glu Phe Phe Pro Met Glu Ala Gln Leu Ser Arg Leu
 Ile Gly Gln Gly Leu Trp Asp Val Ser Arg Ser Ser Thr Gly Asn Leu
 Val Glu Trp Phe Leu Leu Arg Lys Ala Tyr Glu Arg Asn Glu Leu Ala
 Pro Asn Lys Pro Ser Gly Arg Glu Val Glu Ile Arg Arg Arg Gly Tyr
 Ala Gly Gly Tyr Val Lys Glu Pro Glu Arg Gly Leu Trp Glu Asn Ile
 Val Tyr Leu Asp Phe Arg Ser Leu Tyr Pro Ser Ile Ile Ile Thr His
 Asn Val Ser Pro Asp Thr Leu Asn Arg Glu Gly Cys Glu Asn Tyr Asp
 Val Ala Pro Gln Val Gly His Lys Phe Cys Lys Asp Phe Pro Gly Phe
 Ile Pro Ser Leu Leu Gly Gly Leu Leu Glu Glu Arg Gln Lys Ile Lys
 Arg Arg Met Lys Ala Ser Val Asp Pro Val Glu Arg Lys Leu Leu Asp
 Tyr Arg Gln Arg Ala Ile Lys Ile Leu Ala Asn Ser Phe Tyr Gly Tyr
 Tyr Gly Tyr Ala Arg Ala Arg Trp Tyr Cys Arg Glu Cys Ala Glu Ser
 Val Thr Ala Trp Gly Arg Glu Tyr Ile Asp Arg Val Ile Arg Glu Leu
 Glu Glu Lys Phe Gly Phe Lys Val Leu Tyr Ala Asp Thr Asp Gly Leu
 His Ala Thr Ile Pro Gly Ala Asp Ala Gly Thr Val Lys Glu Arg Ala
 Arg Gly Phe Leu Arg Tyr Ile Asn Pro Lys Leu Pro Gly Leu Leu Glu
 Leu Glu Tyr Glu Gly Phe Tyr Leu Arg Gly Phe Phe Val Thr Lys Lys
 Lys Tyr Ala Val Ile Asp Glu Glu Gly Lys Ile Thr Thr Arg Gly Leu
 Glu Ile Val Arg Arg Asp Trp Ser Glu Val Ala Lys Glu Thr Gln Ala
 Arg Val Leu Glu Ala Ile Leu Arg His Gly Asp Val Glu Glu Ala Val
 Arg Ile Val Arg Glu Val Thr Glu Lys Leu Ser Lys Tyr Glu Val Pro
 Pro Glu Lys Leu Val Ile His Glu Gln Ile Thr Arg Asp Leu Arg Asp
 Tyr Lys Ala Thr Gly Pro His Val Ala Val Ala Lys Arg Leu Ala Gly
 Arg Gly Val Arg Ile Arg Pro Gly Thr Val Ile Ser Tyr Ile Val Leu
 Lys Gly Ser Gly Arg Ile Gly Asp Arg Ala Ile Pro Phe Asp Glu Phe
 Asp Pro Thr Lys His Arg Tyr Asp Ala Asp Tyr Tyr Ile Glu Asn Gln
 Val Leu Pro Ala Val Glu Arg Ile Leu Lys Ala Phe Gly Tyr Arg Lys
 Glu Asp Leu Lys Tyr Gln Lys Thr Arg Gln Val Gly Leu Gly Ala Trp
 Leu Asn Ala Gly Lys Gly

SEQ ID NO: 5 – nucleic acid sequence of DNA polymerase from *Thermococcus siculi*

```

atgatcctcg acacggacta catcacggaa gatgggaaac ccgtcataag gatattcaag
aaagagaacg gcgagttcaa gatcgagtac gacaggactt ttgaacccta catctacgcc
ctcctgaagg acgactccgc gattgaggat gttaaaaaga taaccgccga gaggcacgga
acggtggtga aggtcaagcg cgccgaaaag gtgcagaaga agttcctagg caggccggtt
gaagtctgga agctctactt caccaccccc caagatgtcc cggcgataag ggacaagatt
aggaagcatc cagctgtaat tgacatctac gagtacgaca taccattcgc caagcgctac
ctcatcgaca agggcctgat tccgatggag ggtgaagaag agcttaagat gctcgccttc
gacattgaga cgctctacca tgagggtgag gagttcgccg aggggcctat tctgatgata
agctacgccg acgagagcga ggcacgcgtc atcacctgga agaaaatcga cctccccctac
gttgacgtcg tctcaacgga gaaggagatg ataaagcgct tcctccgcgt tgtgaaggag
aaagatcccc atgtcctcat aacctacaac ggcgacaact tcgacttcgc ctacctgaag
aagcgctgtg aaaagcttgg aataaacttc ctcttggaa gggacgggag cgagccgaag
atccagagaa tgggtgaccg cttcgccgtt gaggtgaagg ggaggataca cttcgacctc
tatectgtaa taaggcgcac gataaacctg ccgacctaca tgcttgaggc agtctacgag
gccatctttg ggaagccaaa ggagaagggtt tacgccgagg agatagccac cgcttgggaa
accggagagg gccttgagag ggtggctcgc tactctatgg aggacgcgaa ggtcacgttt
gagcttggaaggaggttctt cccgatggag gcccaacttt cgaggttggt cggccagagc
ttctgggatg tcgcgcgctc aagcacgggc aatctggtcg agtggttcct cctcaggaag
gcctacgaga ggaacgagct ggctccaaac aagccctctg gaaggaata tgacgagagg
cgcggtggat acgccggcgg ctacgtcaag gaaccggaaa agggcctgtg ggagaacata
gtctacctcg actataaatc tctctacccc tcaatcatca tcaccacaa cgtctcgccc
gataccctca accgcgaggg ctgtaaggag tatgacgtag ctccacaggt cggccaccgc
ttctgcaagg actttccagg cttcatcccg agcctgctcg gggatctcct ggaggagagg
cagaagataa agaggaagat gaaggcaaca attgaccgga tcgagagaaa gctccttgat
tacaggcaac gggccatcaa gatccttcta aatagttttt acggctacta cggctacgca
agggctcgct ggtactgcaa ggagtgtgcc gagagcgtta cggcatgggg aagggaatat
atcaccatga caatcagggg aatagaagag aagtatggct ttaaagtact ttatgcggac
actgacggct tcttcgcgac gattcccggg gaagatgccg agaccatcaa aaagagggcg
atggagttcc tcaagtacat aaacgccaaa ctccccggtg cgctcgaact tgagtacgag
gacttctaca ggcgcggctt cttcgtcacc aagaagaaat acgcggttat cgacgaggag
ggcaagataa caacgcgcgg gctggagatc gtcaggcgcg actggagcga gatagccaag
gagacgcagg cgcggttctt ggaggccctt ctgaaggacg gtgacgtcga agaggccgtg
agcatagtca aagaagtgac cgagaagctg agcaagtacg aggttccgcc ggagaagctc
gttatccacg agcagataac gcgcgagctg aaggactaca aggcaacggg accacacgtg
gcgatagcga agaggttagc cgcgagaggg gtcaaaaatcc gccccgggac agtcatcagc
tacatcgctg tcaagggtc cgaggagata ggcgacaggg cgattccctt cgacgagttc
gacccacgga agcacaagta cgatgcagag tactacatcg agaaccaggt tctacctgcc
gtcgagagga ttctgaaggc cttcggctat cgcggtgagg agctcagata ccagaagacg
aggcaggttg gacttggggc gtggctgaag ccgaaggga aggggtga

```

SEQ ID NO: 6 – polypeptide sequence of DNA polymerase from *Thermococcus siculi*

Met Ile Leu Asp Thr Asp Tyr Ile Thr Glu Asp Gly Lys Pro Val Ile
 Arg Ile Phe Lys Lys Glu Asn Gly Glu Phe Lys Ile Glu Tyr Asp Arg
 Thr Phe Glu Pro Tyr Ile Tyr Ala Leu Leu Lys Asp Asp Ser Ala Ile
 Glu Asp Val Lys Lys Ile Thr Ala Glu Arg His Gly Thr Val Val Lys
 Val Lys Arg Ala Glu Lys Val Gln Lys Lys Phe Leu Gly Arg Pro Val
 Glu Val Trp Lys Leu Tyr Phe Thr His Pro Gln Asp Val Pro Ala Ile
 Arg Asp Lys Ile Arg Lys His Pro Ala Val Ile Asp Ile Tyr Glu Tyr
 Asp Ile Pro Phe Ala Lys Arg Tyr Leu Ile Asp Lys Gly Leu Ile Pro
 Met Glu Gly Glu Glu Glu Leu Lys Met Leu Ala Phe Asp Ile Glu Thr
 Leu Tyr His Glu Gly Glu Glu Phe Ala Glu Gly Pro Ile Leu Met Ile
 Ser Tyr Ala Asp Glu Ser Glu Ala Arg Val Ile Thr Trp Lys Lys Ile
 Asp Leu Pro Tyr Val Asp Val Val Ser Thr Glu Lys Glu Met Ile Lys
 Arg Phe Leu Arg Val Val Lys Glu Lys Asp Pro Asp Val Leu Ile Thr
 Tyr Asn Gly Asp Asn Phe Asp Phe Ala Tyr Leu Lys Lys Arg Cys Glu
 Lys Leu Gly Ile Asn Phe Leu Leu Gly Arg Asp Gly Ser Glu Pro Lys
 Ile Gln Arg Met Gly Asp Arg Phe Ala Val Glu Val Lys Gly Arg Ile
 His Phe Asp Leu Tyr Pro Val Ile Arg Arg Thr Ile Asn Leu Pro Thr
 Tyr Met Leu Glu Ala Val Tyr Glu Ala Ile Phe Gly Lys Pro Lys Glu
 Lys Val Tyr Ala Glu Glu Ile Ala Thr Ala Trp Glu Thr Gly Glu Gly
 Leu Glu Arg Val Ala Arg Tyr Ser Met Glu Asp Ala Lys Val Thr Phe
 Glu Leu Gly Lys Glu Phe Phe Pro Met Glu Ala Gln Leu Ser Arg Leu
 Val Gly Gln Ser Phe Trp Asp Val Ala Arg Ser Ser Thr Gly Asn Leu
 Val Glu Trp Phe Leu Leu Arg Lys Ala Tyr Glu Arg Asn Glu Leu Ala
 Pro Asn Lys Pro Ser Gly Arg Glu Tyr Asp Glu Arg Arg Gly Gly Tyr
 Ala Gly Gly Tyr Val Lys Glu Pro Glu Lys Gly Leu Trp Glu Asn Ile
 Val Tyr Leu Asp Tyr Lys Ser Leu Tyr Pro Ser Ile Ile Ile Thr His
 Asn Val Ser Pro Asp Thr Leu Asn Arg Glu Gly Cys Lys Glu Tyr Asp
 Val Ala Pro Gln Val Gly His Arg Phe Cys Lys Asp Phe Pro Gly Phe
 Ile Pro Ser Leu Leu Gly Asp Leu Leu Glu Glu Arg Gln Lys Ile Lys
 Arg Lys Met Lys Ala Thr Ile Asp Pro Ile Glu Arg Lys Leu Leu Asp
 Tyr Arg Gln Arg Ala Ile Lys Ile Leu Leu Asn Ser Phe Tyr Gly Tyr
 Tyr Gly Tyr Ala Arg Ala Arg Trp Tyr Cys Lys Glu Cys Ala Glu Ser
 Val Thr Ala Trp Gly Arg Glu Tyr Ile Thr Met Thr Ile Arg Glu Ile
 Glu Glu Lys Tyr Gly Phe Lys Val Leu Tyr Ala Asp Thr Asp Gly Phe
 Phe Ala Thr Ile Pro Gly Glu Asp Ala Glu Thr Ile Lys Lys Arg Ala
 Met Glu Phe Leu Lys Tyr Ile Asn Ala Lys Leu Pro Gly Ala Leu Glu
 Leu Glu Tyr Glu Asp Phe Tyr Arg Arg Gly Phe Phe Val Thr Lys Lys
 Lys Tyr Ala Val Ile Asp Glu Glu Gly Lys Ile Thr Thr Arg Gly Leu
 Glu Ile Val Arg Arg Asp Trp Ser Glu Ile Ala Lys Glu Thr Gln Ala
 Arg Val Leu Glu Ala Leu Leu Lys Asp Gly Asp Val Glu Glu Ala Val
 Ser Ile Val Lys Glu Val Thr Glu Lys Leu Ser Lys Tyr Glu Val Pro
 Pro Glu Lys Leu Val Ile His Glu Gln Ile Thr Arg Glu Leu Lys Asp
 Tyr Lys Ala Thr Gly Pro His Val Ala Ile Ala Lys Arg Leu Ala Ala
 Arg Gly Val Lys Ile Arg Pro Gly Thr Val Ile Ser Tyr Ile Val Leu
 Lys Gly Ser Gly Arg Ile Gly Asp Arg Ala Ile Pro Phe Asp Glu Phe
 Asp Pro Thr Lys His Lys Tyr Asp Ala Glu Tyr Tyr Ile Glu Asn Gln
 Val Leu Pro Ala Val Glu Arg Ile Leu Lys Ala Phe Gly Tyr Arg Gly
 Glu Glu Leu Arg Tyr Gln Lys Thr Arg Gln Val Gly Leu Gly Ala Trp
 Leu Lys Pro Lys Gly Lys Gly

SEQ ID NO: 7 - polypeptide sequence of DNA polymerase from *Thermococcus kodakarensis*

Met Ile Leu Asp Thr Asp Tyr Ile Thr Glu Asp Gly Lys Pro Val Ile
 Arg Ile Phe Lys Lys Glu Asn Gly Glu Phe Lys Ile Glu Tyr Asp Arg
 Thr Phe Glu Pro Tyr Phe Tyr Ala Leu Leu Lys Asp Asp Ser Ala Ile
 Glu Glu Val Lys Lys Ile Thr Ala Glu Arg His Gly Thr Val Val Thr
 Val Lys Arg Val Glu Lys Val Gln Lys Lys Phe Leu Gly Arg Pro Val
 Glu Val Trp Lys Leu Tyr Phe Thr His Pro Gln Asp Val Pro Ala Ile
 Arg Asp Lys Ile Arg Glu His Pro Ala Val Ile Asp Ile Tyr Glu Tyr
 Asp Ile Pro Phe Ala Lys Arg Tyr Leu Ile Asp Lys Gly Leu Val Pro
 Met Glu Gly Asp Glu Glu Leu Lys Met Leu Ala Phe Asp Ile Glu Thr
 Leu Tyr Glu Glu Gly Glu Glu Phe Ala Glu Gly Pro Ile Leu Met Ile
 Ser Tyr Ala Asp Glu Glu Gly Ala Arg Val Ile Thr Trp Lys Asn Val
 Asp Leu Pro Tyr Val Asp Val Val Ser Thr Glu Arg Glu Met Ile Lys
 Arg Phe Leu Arg Val Val Lys Glu Lys Asp Pro Asp Val Leu Ile Thr
 Tyr Asn Gly Asp Asn Phe Asp Phe Ala Tyr Leu Lys Lys Arg Cys Glu
 Lys Leu Gly Ile Asn Phe Ala Leu Gly Arg Asp Gly Ser Glu Pro Lys
 Ile Gln Arg Met Gly Asp Arg Phe Ala Val Glu Val Lys Gly Arg Ile
 His Phe Asp Leu Tyr Pro Val Ile Arg Arg Thr Ile Asn Leu Pro Thr
 Tyr Thr Leu Glu Ala Val Tyr Glu Ala Val Phe Gly Gln Pro Lys Glu
 Lys Val Tyr Ala Glu Glu Ile Thr Thr Ala Trp Glu Thr Gly Glu Asn
 Leu Glu Arg Val Ala Arg Tyr Ser Met Glu Asp Ala Lys Val Thr Tyr
 Glu Leu Gly Lys Glu Phe Leu Pro Met Glu Ala Gln Leu Ser Arg Leu
 Ile Gly Gln Ser Leu Trp Asp Val Ser Arg Ser Ser Thr Gly Asn Leu
 Val Glu Trp Phe Leu Leu Arg Lys Ala Tyr Glu Arg Asn Glu Leu Ala
 Pro Asn Lys Pro Asp Glu Lys Glu Leu Ala Arg Arg Arg Gln Ser Tyr
 Glu Gly Gly Tyr Val Lys Glu Pro Glu Arg Gly Leu Trp Glu Asn Ile
 Val Tyr Leu Asp Phe Arg Ser Leu Tyr Pro Ser Ile Ile Ile Thr His
 Asn Val Ser Pro Asp Thr Leu Asn Arg Glu Gly Cys Lys Glu Tyr Asp
 Val Ala Pro Gln Val Gly His Arg Phe Cys Lys Asp Phe Pro Gly Phe
 Ile Pro Ser Leu Leu Gly Asp Leu Leu Glu Glu Arg Gln Lys Ile Lys
 Lys Lys Met Lys Ala Thr Ile Asp Pro Ile Glu Arg Lys Leu Leu Asp
 Tyr Arg Gln Arg Ala Ile Lys Ile Leu Ala Asn Ser Tyr Tyr Gly Tyr
 Tyr Gly Tyr Ala Arg Ala Arg Trp Tyr Cys Lys Glu Cys Ala Glu Ser
 Val Thr Ala Trp Gly Arg Glu Tyr Ile Thr Met Thr Ile Lys Glu Ile
 Glu Glu Lys Tyr Gly Phe Lys Val Ile Tyr Ser Asp Thr Asp Gly Phe
 Phe Ala Thr Ile Pro Gly Ala Asp Ala Glu Thr Val Lys Lys Lys Ala
 Met Glu Phe Leu Lys Tyr Ile Asn Ala Lys Leu Pro Gly Ala Leu Glu
 Leu Glu Tyr Glu Gly Phe Tyr Glu Arg Gly Phe Phe Val Thr Lys Lys
 Lys Tyr Ala Val Ile Asp Glu Glu Gly Lys Ile Thr Thr Arg Gly Leu
 Glu Ile Val Arg Arg Asp Trp Ser Glu Ile Ala Lys Glu Thr Gln Ala
 Arg Val Leu Glu Ala Leu Leu Lys Asp Gly Asp Val Glu Lys Ala Val
 Arg Ile Val Lys Glu Val Thr Glu Lys Leu Ser Lys Tyr Glu Val Pro
 Pro Glu Lys Leu Val Ile His Glu Gln Ile Thr Arg Asp Leu Lys Asp
 Tyr Lys Ala Thr Gly Pro His Val Ala Val Ala Lys Arg Leu Ala Ala
 Arg Gly Val Lys Ile Arg Pro Gly Thr Val Ile Ser Tyr Ile Val Leu
 Lys Gly Ser Gly Arg Ile Gly Asp Arg Ala Ile Pro Phe Asp Glu Phe
 Asp Pro Thr Lys His Lys Tyr Asp Ala Glu Tyr Tyr Ile Glu Asn Gln
 Val Leu Pro Ala Val Glu Arg Ile Leu Arg Ala Phe Gly Tyr Arg Lys
 Glu Asp Leu Arg Tyr Gln Lys Thr Arg Gln Val Gly Leu Ser Ala Trp
 Leu Lys Pro Lys Gly Thr

SAMPLE TAG SEQUENCES

SEQ ID Number	Sample tag sequence
8	TAGAATTGAAGAA
9	TGGCCATAGCTAC
10	GTCATCTGCGACC
11	TTCGCGCTTGGAC
12	CGCGAACCGTTAG
13	TTGCAGCCTCTAA
14	TCTACTAGTACGA
15	GTAGGTTCTACTG
16	GCCAATATCAAGT
17	CTATCTTGCTGGT
18	GTTCTCATAGGTA
19	GTCTATGAACCAA
20	CGGAGCGCTTATT
21	TATGCCATGAGGA
22	ATACGACTCGGAG
23	GATGGAACTCAGC
24	GGACCTGCATGAA
25	TAGACTGGAACTT
26	GAATTACCTCGTT
27	AGGATCAGGCTAC
28	ACGCGTAGAAGAG
29	CTTCGAGACTTAC
30	GACGGCTAACTCC
31	TTAGCATTCCTCTT

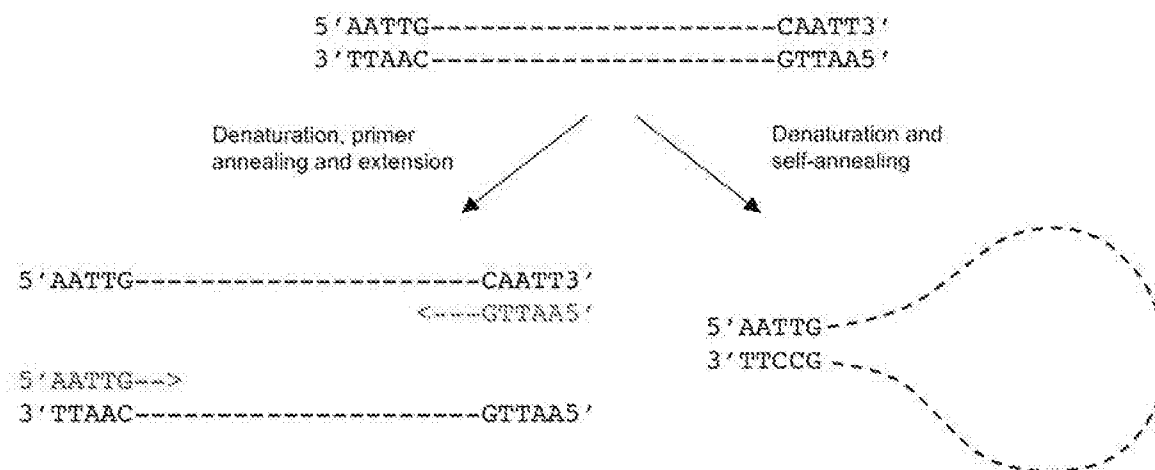
32	GCAAGGCATAGTA
33	ACCTAGATATGGA
34	ACGCCAAGGCGTA
35	TATGACGGATCCG
36	CCTCCATTAGAGA
37	ATTGAATACTCTG
38	GAGATGAGAAGAA
39	TCTGAGTAGCCGG
40	AATAGGTAGTACG
41	GTCGAAGAAGTCC
42	TACTGCATCTCGT
43	GACGTATTAGAGC
44	CCTGCATTATTCG
45	ACGAATGATGCTC
46	TACTAGCAGAGAT
47	CTCCTCATCTTCC
48	TCCTCTGCGCTGC
49	CCTTCTCAGTCCG
50	CAGCTTCATAGCG
51	TTGACTCTCGCGC
52	TATCCTGAGCGAT
53	AACGCCTAGCCGA
54	CCGAAGACGTCAT
55	GAGTTCTCCAGAT
56	TGCATCCGCGCTT
57	CCTGAACTCAAGT
58	GGTCGTATGCGTA

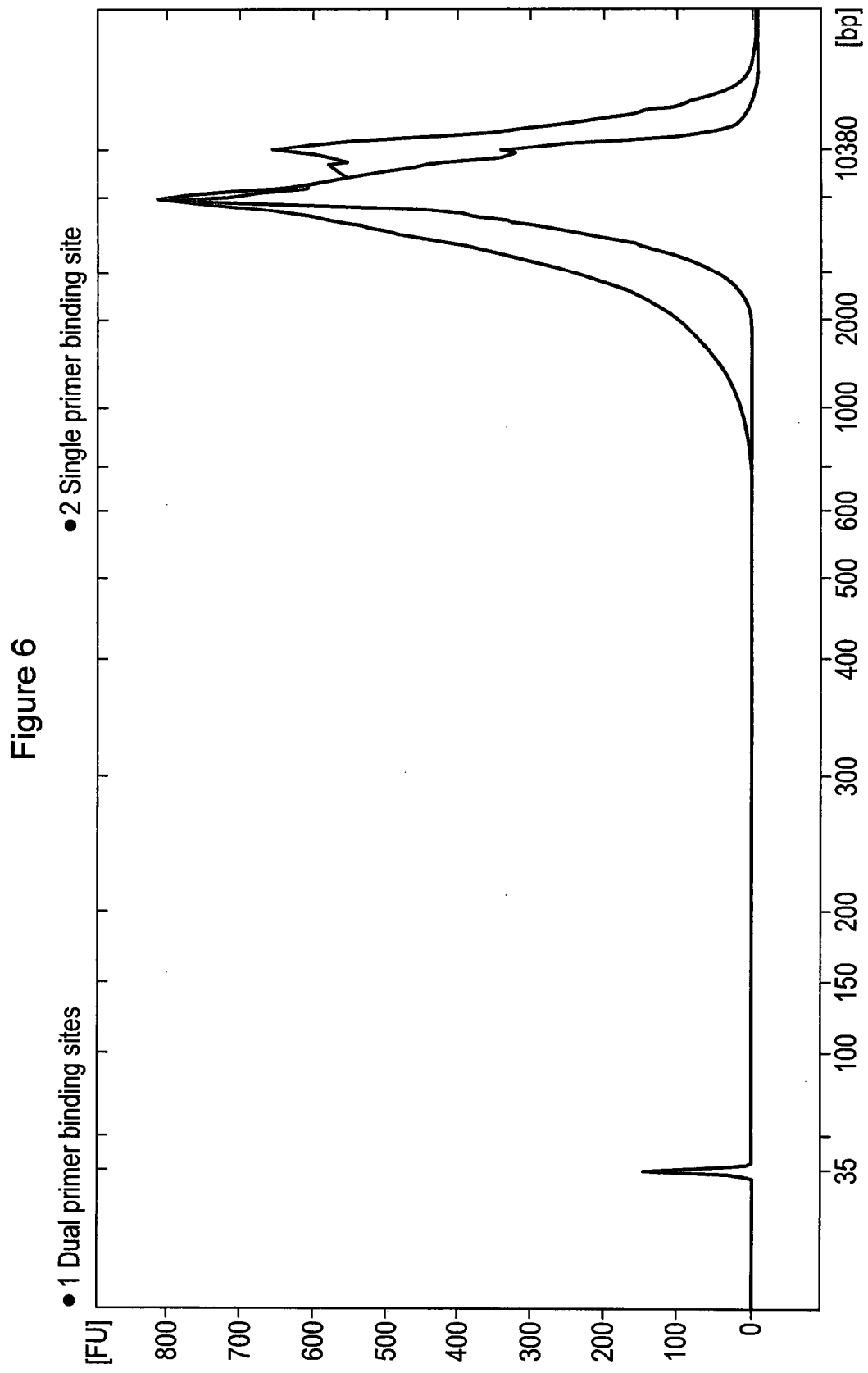
59	AGGCCTCTCTACC
60	GTACTCCATCCAA
61	CAGCGGACGCGCT
62	ATCTCTCTTAGCA
63	AAGCAATAATAAT
64	AAGGCGACTCCGA
65	ACGTCTCTAGGAG
66	CCATCAGACCTCT
67	ACTTAATCGTACT
68	TGGAATTCTCCAA
69	CCATACGATCAGG
70	TTATGGAGCAATA
71	GCTCGGCGTTCGA
72	TTGGCCAGTCGCT
73	CAGATACGTAGAG
74	AATGCTATTATCC
75	GCAGCATGCCGAT
76	GGAGAGTTACCTC
77	GAGAGTCCATGAT
78	CAATCTATTCTGA
79	GCTCTTAGTATCC
80	CCATAGTTATGGT
81	TGCGAGATCGAAG
82	AGAGAAGTCGAGT
83	GGTAACTCCATAT
84	TGCTATTCCAGGC
85	AACCGCGAGGCTC

86	TTCTAGAGATACC
87	TTCGCTCAAGTAT
88	CAGAGAAGGCGCA
89	TAGAATTGGCCTC
90	GGCCATTCTCCAG
91	TCCAACGCGCGTT
92	GCCGCAGATTACG
93	GCAGTTCGAACGC
94	TTCTCTCTGCAGG
95	TAAGCTACCAGCG
96	CTGCATGAGGTTG
97	TTGCCTAGCGAGG
98	CAACTGAATTAGG
99	AAGCGGTCCTCTT
100	AATGGAAGGACCG
101	GAGTTAGTAAGTT
102	TTCCTAATTCCAA
103	GTTCTGGTTCGCT
104	GTTCATCTCTTCC
105	ATTCCGAGGAAGA
106	CTTAGCCGAGAGA
107	GTCTGCTACGCTT
108	ATGGCGCCGCGCA
109	TAATTGGTTATCT
110	TCGGTTATAAGTC
111	TGCCTGAGAACGT
112	AGATGCGGTTAAC

113	ATGGAATAGGCGA
114	AGAGATGCGATCG
115	CTCCAACTAACGT
116	GCCTTGCTACTGG
117	CTTCGTCTCTACG
118	ACGCTCATAGCCT
119	GTCGAAGATAAGG
120	GCCGGAGTCCTCG
121	TATACGGCGACCT
122	AGGTAGATATTCTG
123	TTAAGGTACTGCT
124	CGGATCTGGTATA
125	GAGGTCTCGGAGG
126	GGCATCGATGGAC
127	GATCTCCGATATA
128	GATTCGGAATACT
129	CTGCGATCCGGCC
130	GATCCGGTTGCAA
131	CGTCAGGCTTGAC
132	TCGGCAAGGCGAG
133	GAACGGCGAACGC
134	CCTCAAGCGGACT
135	GAAGCCAGATGGT
136	TGCTCATACCAAT

FIGURE 5





original ——— T ——— strand 1
 ——— A ——— strand 2

FIGURE 7

———— C ———
 ——— G ———

mutation
 step

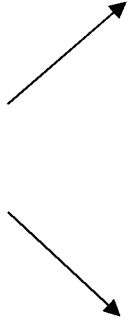
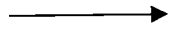
———— P ———
 ——— A ———

recovery
 step

———— P ———
 ——— A ———
 ——— G ———
 ——— C ———
 ——— T ———
 ——— A ———
 ——— G ———

no mutation

T → C



———— P ———
 ——— A ———
 ——— G ———
 ——— C ———
 ——— T ———
 ——— A ———
 ——— G ———

C → T

no mutation