

Escherichia coli* – *Staphylococcus aureus* Shuttle Vector pCN56, Recombinant in *Escherichia coli

Catalog No. NR-46156

Product Description: NR-46156 is a culture of *Escherichia coli* (*E. coli*) DH5α (RN9621, NRS621) containing the *E. coli*-staphylococcal shuttle vector pCN56. Vector pCN56 contains the *E. coli* ColE1 replication origin, the high-copy-number *Staphylococcus aureus* (*S. aureus*) pT181 *cop-623-repC* replicon, the GFP reporter gene *gfpmut2* and the *blaZ* transcriptional terminator. Vector pCN56 was deposited as resistant to ampicillin and erythromycin in *E. coli* and resistant to erythromycin in *S. aureus*.

Lot¹: 63381375

Manufacturing Date: 11MAR2015

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis Cellular morphology Colony morphology ² Motility (wet mount)	Gram-negative rods Report results Report results	Gram-negative rods Circular, convex, entire, smooth and cream (Figure 1) Motile
Confirmation of pCN56 Sequence Illumina [®] MiSeq [®] sequence (Figure 2, Table 1)	Report results	Consistent with pCN56 vector description ^{3,4}
Antibiotic Resistance Erythromycin (encoded by the adenine methylase gene <i>ermC</i>) Ampicillin (encoded by the beta-lactamase gene <i>amp</i>)	<i>ermC</i> sequence present <i>amp</i> sequence present	<i>ermC</i> sequence confirmed <i>amp</i> sequence confirmed
Antibiotic Resistance Ampicillin (100 µg/mL) ²	Resistant (growth)	Growth observed
Purity (post-freeze)⁵	Growth consistent with <i>E. coli</i>	Growth consistent with <i>E. coli</i>
Viability (post-freeze)²	Growth	Growth

¹NR-46156 was produced by inoculation of the deposited material in Luria-Bertani (LB) broth with 100 µg/mL ampicillin and incubated for 24 hours at 37°C in an aerobic atmosphere with shaking at ~ 200 rpm. Broth inoculum was passaged once in LB broth with 100 µg/mL ampicillin for 29 hours at 37°C in an aerobic atmosphere with shaking at ~ 200 rpm to produce this lot.

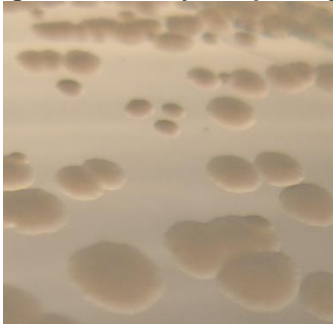
²20 hours at 37°C in an aerobic atmosphere on LB agar with 100 µg/mL ampicillin

³Illumina[®] MiSeq[®] sequence was analyzed with CLC Genomics Workbench Version 7.0.2.

⁴pCN56 was sequenced and annotated by BEI Resources and is consistent with the vector described in Charpentier, E., et al. "Novel Cassette-Based Shuttle Vector System for Gram-Positive Bacteria." *Appl. Environ. Microbiol.* 70 (2004): 6076-6085. PubMed: 15466553. The BEI Resources vector sequence was deposited into GenBank as NR-46156 (GenBank: KR781471).

⁵Purity of this lot was assessed for 7 days on Tryptic Soy agar with 5% defibrinated sheep blood at 37°C in an aerobic atmosphere

Figure 1: Colony Morphology



Date: 28 JUL 2016

Signature: 
BEI Resources Authentication

ATCC®, on behalf of BEI Resources, hereby represents and warrants that the material provided under this certificate has been subjected to the tests and procedures specified and that the results described, along with any other data provided in this certificate, are true and accurate to the best of ATCC®'s knowledge.

ATCC® is a trademark of the American Type Culture Collection.

You are authorized to use this product for research use only. It is not intended for human use.



Figure 2: Shuttle Vector pCN56

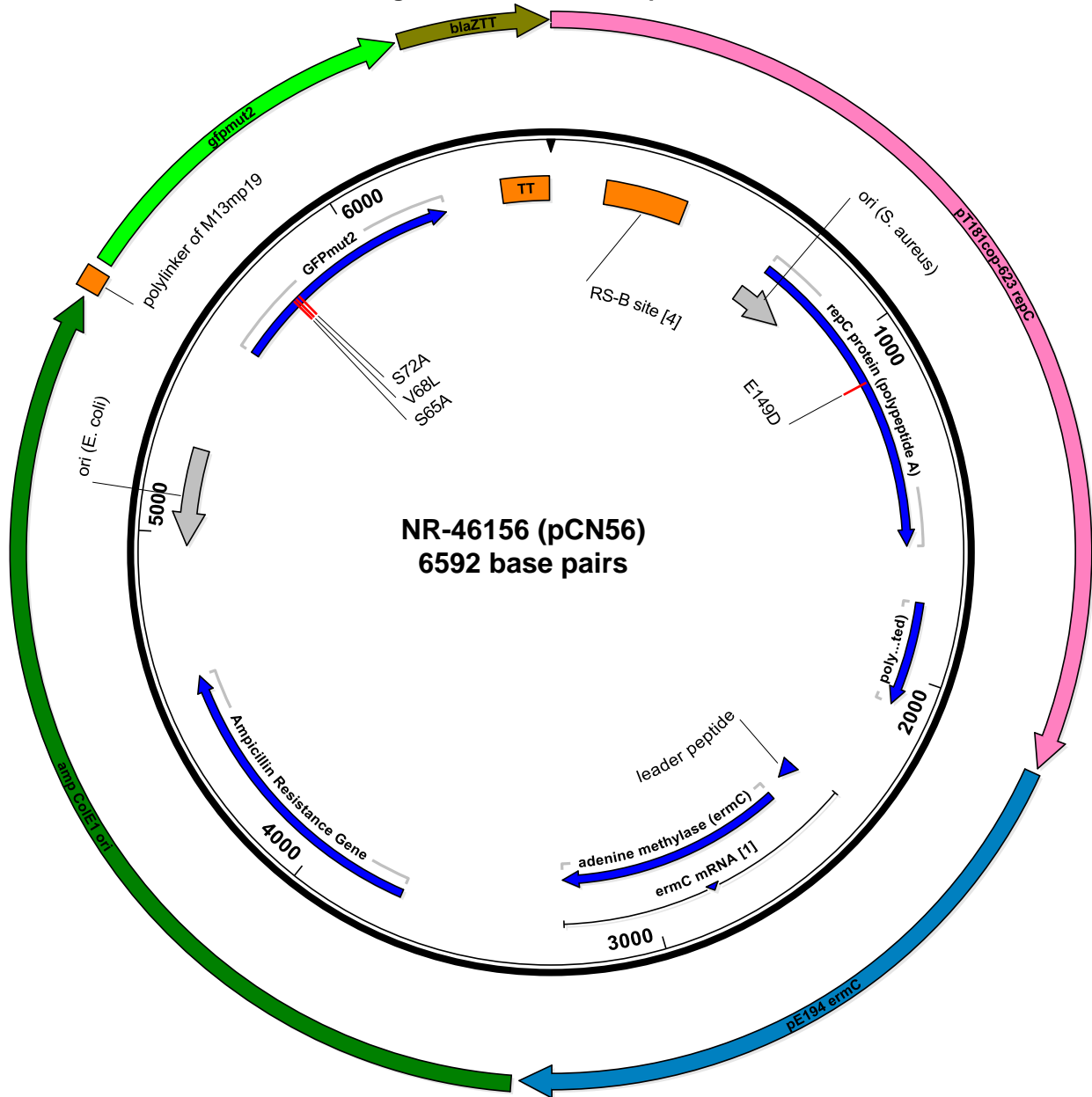


Table 1: Sequence of shuttle vector pCN56

1	CCTTTGCGAA	AGAGTTAATA	AGTTAACAGA	AGATGAACCA	AAACTAAATG	50
51	GTTTAGCAGG	AAACTTAGAT	AAAAAATGA	ATCCAGAATT	ATATTGAGAA	100
101	CAGGAACAGC	AACAAGAACA	ACAAAAGAAT	CAAAAACGAG	ATAGAGGTAT	150
151	GCACTTATAG	AACATGCATT	TATGCCGAGA	AACTTATTG	GTTGGAATGG	200
201	GCTATGTGTT	AGCTAACTTG	TTAGCGAGTT	GGTTGGACTT	GAATTGGGAT	250
251	TAATCCCAAG	AAAGTACCAA	CTCAACAACA	CATAAAGCCC	TGTAGGTTCC	300
301	GACCAATAAG	GAAATTGGAA	TAAAGCAATA	AAAGGAGTTG	AAGAAATGAA	350
351	ATTCAGAGAA	GCCTTTGAGA	ATTTTATAAC	AAGTAAGTAT	GTAATTGGTG	400
401	TTTTAGTAGT	TTTAACTGTT	TACCAGATAA	TACAAATGCT	TAAATAAAAA	450
451	AAGACTTGAT	CTGATTAGAC	CAAATCTTTT	GATAGTGTTA	TATTAATAAC	500
501	AAAATAAAAA	GGAGTCGCTC	ACGCCCTACC	AAAGTTTGTG	AACGACATCA	550
551	TTCAAAGAAA	AAAACACTGA	GTTGTTTTTA	TAATCTTGTA	TATTTAGATA	600
601	TTAAACGATA	TTTAAATATA	CATCAAGATA	TATATTTGGG	TGAGCGATTA	650
651	CTTAAACGAA	ATTGAGATTA	AGGAGTCGAT	TTTTTATGTA	TAAAAACAAT	700
701	CATGCAAATC	ATTCAAATCA	TTTGAAAAAT	CACGATTTAG	ACAATTTTTTC	750
751	TAAAACCGGC	TACTCTAATA	GCCGGTTGGA	CGCACATACT	GTGTGCATAT	800
801	CTGATCCAAA	ATTAAGTTTT	GATGCAATGA	CGATCGTTGG	AAATCTCAAC	850
851	CGAGACAACG	CTCAAGCCCT	TTCTAAATTT	ATGAGTGTAG	AGCCCCAAAT	900
901	AAGACTTTGG	GATATTCTTC	AAACAAAGTT	TAAAGCTAAA	GCACTTCAAG	950
951	AAAAAGTTTA	TATTGAATAT	GACAAAGTGA	AAGCAGATAG	TTGGGATAGA	1000
1001	CGTAATATGC	GTATTGAATT	TAATCCAAAC	AACTTACAC	GAGATGAAAT	1050
1051	GATTTGGTTA	AAACAAAATA	TAATAAGCTA	CATGGAAGAT	GACGGTTTTA	1100
1101	CAAGATTAGA	TTTAGCCTTT	GATTTTGAAG	ATGATTTGAG	TGACTACTAT	1150
1151	GCAATGTCTG	ATAAAGCAGT	TAAGAAACT	ATTTTTTATG	GTCGTAATGG	1200
1201	TAAGCCAGAA	ACAAAATATT	TTGGCGTGAG	AGATAGTAAT	AGATTTATTA	1250
1251	GAATTTATAA	TAAAAAGCAA	GAACGTAAAG	ATAATGCAGA	TGCTGAAGTT	1300
1301	ATGTCTGAAC	ATTTATGGCG	TGTAGAAATC	GAACTTAAAA	GAGATATGGT	1350
1351	GGATTACTGG	AATGATTGCT	TTAGTGATTT	ACATATCTTG	CAACCAGATT	1400
1401	GGAAAACAT	CCAACGCACT	GCGGATAGAG	CAATAGTTTT	TATGTTATTG	1450
1451	AGTGATGAAG	AAGAATGGGG	AAAGCTTCAC	AGAAATTCTA	GAACAAAATA	1500
1501	TAAGAATTTG	ATAAAAGAAA	TTTCGCCAGT	CGATTTAACG	GACTTAATGA	1550
1551	AATCGACTTT	AAAAGCGAAC	GAAAAACAAT	TGCAAAAACA	AATCGATTTT	1600
1601	TGGCAACATG	AATTTAAATT	TTGGAAATAG	TGTACATATT	AATATTACTG	1650
1651	AACAAAATG	ATATATTTAA	ACTATTCTAA	TTTAGGAGGA	TTTTTTTATG	1700
1701	AAGTGTCTAT	TTAAAAATTT	GGGGAATTTA	TATGAGGTGA	AAGAATAATT	1750
1751	TACCCCTATA	AACTTTAGTC	ACCTCAAGTA	AAGAGGTAAA	ATTGTTTAGT	1800
1801	TTATATAAAA	AATTTAAAGG	TTTGTTTTAT	AGCGTTTTAT	TTTGGCTTTG	1850
1851	TATTCTTTCA	TTTTTTAGTG	TATTAATGA	AATGGTTTTA	AATGTTTCTT	1900
1901	TACCTGATAT	TGCAAATCAT	TTTAATACTA	CTCCTGGAAT	TACAACTGG	1950
1951	GTAAACACTG	CATATATGTT	AACTTTTTTCG	ATAGGAACAG	CAGTATATGG	2000
2001	AAAATTATCT	GATTATATAA	ATATAAAAAA	ATTGTTAATT	ATTGGTATTA	2050
2051	GTTTGAGCTG	TCTTGTTTCA	TTGATTGCTT	TTATTGGGCC	CACCTAGGAA	2100
2101	TTGAATGAGA	CATGCTACAC	CTCCGGATAA	TAAATATATA	TAAACGTATA	2150
2151	TAGATTTTCA	AAAGTCTAAC	ACACTAGACT	TATTTACTTC	GTAATTAAGT	2200
2201	CGTTAAACCG	TGTGCTCTAC	GACCAAAACT	ATAAAACCTT	TAAGAACTTT	2250
2251	CTTTTTTTTAC	AAGAAAAAAG	AAATTAGATA	AATCTCTCAT	ATCTTTTATT	2300
2301	CAATAATCGC	ATCCGATTGC	AGTATAAATT	TAACGATCAC	TCATCATGTT	2350
2351	CATATTTATC	AGAGCTCGTG	CTATAATTAT	ACTAATTTTA	TAAGGAGGAA	2400
2401	AAAATATGGG	CATTTTTAGT	ATTTTTGTAA	TCAGCACAGT	TCATTATCAA	2450
2451	CCAAACAAAA	AATAAGTGGT	TATAATGAAT	CGTTAATAAG	CAAAATTCAT	2500
2501	ATAACCAAAT	TAAAGAGGGT	TATAATGAAC	GAGAAAAATA	TAAAACACAG	2550
2551	TCAAAACTTT	ATTACTTCAA	AACATAATAT	AGATAAAAATA	ATGACAAATA	2600

2601	TAAGATTA	TGAACATGAT	AATATCTTTG	AAATCGGCTC	AGGAAAAGGC	2650
2651	CATTTTACCC	TTGAATTAGT	AAAGAGGTGT	AATTTTCGTAA	CTGCCATTGA	2700
2701	AATAGACCAT	AAATTATGCA	AAACTACAGA	AAATAAACTT	GTTGATCACG	2750
2751	ATAAATTTCCA	AGTTTTAAAC	AAGGATATAT	TGCAGTTTAA	ATTTCTTAAA	2800
2801	AACCAATCCT	ATAAAATATA	TGGTAATATA	CCTTATAACA	TAAGTACGGA	2850
2851	TATAATACGC	AAAATTGTTT	TTGATAGTAT	AGCTAATGAG	ATTTATTTAA	2900
2901	TCGTGGAATA	CGGGTTTGCT	AAAAGATTAT	TAAATACAAA	ACGCTCATTG	2950
2951	GCATTACTTT	TAATGGCAGA	AGTTGATATT	TCTATATTAA	GTATGGTTCC	3000
3001	AAGAGAATAT	TTTCATCCTA	AACCTAAAGT	GAATAGCTCA	CTTATCAGAT	3050
3051	TAAGTAGAAA	AAAATCAAGA	ATATCACACA	AAGATAAACA	AAAGTATAAT	3100
3101	TATTTTCGTTA	TGAAATGGGT	TAACAAAGAA	TACAAGAAAA	TATTTACAAA	3150
3151	AAATCAATTT	AACAATTCCT	TAAAACATGC	AGGAATTGAC	GATTTAAACA	3200
3201	ATATTAGCTT	TGAACAATTC	TTATCTCTTT	TCAATAGCTA	TAAATTATTT	3250
3251	AATAAGTAAG	TTAAGGGATG	CATAAACTGC	ATCCCTTAAC	TTGTTTTTCG	3300
3301	TGTGCCTATT	TTTTGTGAAT	CGATTATGTC	TTTTGCGCAG	TCGGCTTAAA	3350
3351	CCAGTTTTTC	GCGGCGCTCG	AGCGGCCGCA	TAGTTAAGCC	AGCCCCGACA	3400
3401	CCCGCCAACA	CCCCTGACG	CGCCCTGACG	GGCTTGTCTG	CTCCCGGCAT	3450
3451	CCGCTTACAG	ACAAGCTGTG	ACCGTCTCCG	GGAGCTGCAT	GTGTCAGAGG	3500
3501	TTTTACCCGT	CATCACCGAA	ACGCGCGAGA	CGAAAGGGCC	TCGTGATACG	3550
3551	CCTATTTTTA	TAGGTTAATG	TCATGATAAT	AATGGTTTCT	TAGACGTCAG	3600
3601	GTGGCACTTT	TCGGGGAAAT	GTGCGCGGAA	CCCCATTTTG	TTTATTTTTTC	3650
3651	TAAATACATT	CAAATATGTA	TCCGCTCATG	AGACAATAAC	CCTGATAAAT	3700
3701	GCTTCAATAA	TATTGAAAAA	GGAAGAGTAT	GAGTATTCAA	CATTTCCGTG	3750
3751	TCGCCCTTAT	TCCCTTTTTT	GCGGCATTTT	GCCTTCTCTG	TTTTTGCTCAC	3800
3801	CCAGAAACGC	TGGTGAAAGT	AAAAGATGCT	GAAGATCAGT	TGGGTGCACG	3850
3851	AGTGGGTAC	ATCGAACTGG	ATCTCAACAG	CGGTAAGATC	CTTGAGAGTT	3900
3901	TTCGCCCCGA	AGAACGTTTT	CCAATGATGA	GCACTTTTAA	AGTTCTGCTA	3950
3951	TGTGGCGCGG	TATTATCCCG	TATTGACGCC	GGGCAAGAGC	AACTCGGTCG	4000
4001	CCGCATACAC	TATTCTCAGA	ATGACTTGGT	TGAGTACTCA	CCAGTCACAG	4050
4051	AAAAGCATCT	TACGGATGGC	ATGACAGTAA	GAGAATTATG	CAGTGTGCC	4100
4101	ATAACCATGA	GTGATAACAC	TGCGGCCAAC	TTACTTCTGA	CAACGATCGG	4150
4151	AGGACCGAAG	GAGCTAACCG	CTTTTTTTGCA	CAACATGGGG	GATCATGTAA	4200
4201	CTCGCCTTGA	TCGTTGGGAA	CCGGAGCTGA	ATGAAGCCAT	ACCAAACGAC	4250
4251	GAGCGTGACA	CCACGATGCC	TGTAGCAATG	GCAACAACGT	TGCGCAAAC	4300
4301	ATTAACCTGGC	GAACACTTTA	CTCTAGCTTC	CCGGCAACAA	TTAATAGACT	4350
4351	GGATGGAGGC	GGATAAAGTT	GCAGGACCAC	TTCTGCGCTC	GGCCCTTCCG	4400
4401	GCTGGCTGGT	TTATTGCTGA	TAAATCTGGA	GCCGGTGAGC	GTGGGTCTCG	4450
4451	CGGTATCATT	GCAGCACTGG	GGCCAGATGG	TAAGCCCTCC	CGTATCGTAG	4500
4501	TTATCTACAC	GACGGGGAGT	CAGGCAACTA	TGGATGAACG	AAATAGACAG	4550
4551	ATCGCTGAGA	TAGGTGCCTC	ACTGATTAAG	CATTGGTAAC	TGTCAGACCA	4600
4601	AGTTTACTCA	TATATACTTT	AGATTGATTT	AAAACCTCAT	TTTTAATTTA	4650
4651	AAAGGATCTA	GGTGAAGATC	CTTTTTTGATA	ATCTCATGAC	CAAAAATCCCT	4700
4701	TAACGTGAGT	TTTCGTTCCA	CTGAGCGTCA	GACCCCGTAG	AAAAGATCAA	4750
4751	AGGATCTTCT	TGAGATCCTT	TTTTTCTGCG	CGTAATCTGC	TGCTTGCAAA	4800
4801	CAAAAAAACC	ACCGCTACCA	GCGGTGGTTT	GTTTGCCGGA	TCAAGAGCTA	4850
4851	CCAACCTTTT	TTCCGAAGGT	AACTGGCTTC	AGCAGAGCGC	AGATAACAAA	4900
4901	TACTGTTCTT	CTAGTGTAGC	CGTAGTTAGG	CCACCACTTC	AAGAACTCTG	4950
4951	TAGCACCGCC	TACATACTTC	GCTCTGCTAA	TCCTGTTACC	AGTGGCTGCT	5000
5001	GCCAGTGGCG	ATAAGTCGTG	TCTTACCGGG	TTGGACTCAA	GACGATAGTT	5050
5051	ACCGGATAAG	GCGCAGCGGT	CGGGCTGAAC	GGGGGGTTTCG	TGCACACAGC	5100
5101	CCAGCTTGGA	GCGAACGACC	TACACCGAAC	TGAGATACCT	ACAGCGTGAG	5150
5151	CTATGAGAAA	GCGCCACGCT	TCCCGAAGGG	AGAAAGGCGG	ACAGGTATCC	5200
5201	GGTAAGCGGC	AGGGTCGGAA	CAGGAGAGCG	CACGAGGGAG	CTTCCAGGGG	5250

5251	GAAACGCCTG	GTATCTTTAT	AGTCCTGTGC	GGTTTCGCCA	CCTCTGACTT	5300
5301	GAGCGTCGAT	TTTTGTGATG	CTCGTCAGGG	GGGCGGAGCC	TATGGAAAAA	5350
5351	CGCCAGCAAC	GCGGCCTTTT	TACGGTTTCT	GGCCTTTTGC	TGGCCTTTTG	5400
5401	CTCACATGTT	CTTTCCTGCG	TTATCCCCTG	ATTCTGTGGA	TAACCGTATT	5450
5451	ACCGCCTTTG	AGTGAGCTGG	CGGCCGCTGC	ATGCCTGCAG	GTCGACTCTA	5500
5501	GAGGATCCCC	GGGTACCGAG	CTCGAATTTC	TTAACTAATT	AATTTAAGAA	5550
5551	GGAGATATAC	ATATGAGTAA	AGGAGAAGAA	CTTTTCACTG	GAGTTGTCCC	5600
5601	AATTCTTGTT	GAATTAGATG	GTGATGTTAA	TGGGCACAAA	TTTTCTGTCA	5650
5651	GTGGAGAGGG	TGAAGGTGAT	GCAACATACG	GAAAACCTAC	CCTTAAATTT	5700
5701	ATTTGCACTA	CTGGAAAAC	ACCTGTTCCA	TGGCCAACAC	TTGTCACTAC	5750
5751	TTTCGCGTAT	GGTCTTCAAT	GCTTTGCGAG	ATACCCAGAT	CATATGAAAC	5800
5801	AGCATGACTT	TTTCAAGAGT	GCCATGCCCG	AAGGTTATGT	ACAGGAAAGA	5850
5851	ACTATATTTT	TCAAAGATGA	CGGGAACCTAC	AAGACACGTG	CTGAAGTCAA	5900
5901	GTTTGAAGGT	GATACCCTTG	TTAATAGAAT	CGAGTTAAAA	GGTATTGATT	5950
5951	TTAAAGAAGA	TGGAAACATT	CTTGGACACA	AATTGGAATA	CAACTATAAC	6000
6001	TCACACAATG	TATACATCAT	GGCAGACAAA	CAAAAGAATG	GAATCAAAGT	6050
6051	TAACCTCAAA	ATTAGACACA	ACATTGAAGA	TGGAAGCGTT	CAACTAGCAG	6100
6101	ACCATTATCA	ACAAAATACT	CCAATTGGCG	ATGGCCCTGT	CCTTTTACCA	6150
6151	GACAACCATT	ACCTGTCCAC	ACAATCTGCC	CTTTCGAAAG	ATCCCAACGA	6200
6201	AAAGAGAGAC	CACATGGTCC	TTCTTGAGTT	TGTAACAGCT	GCTGGGATTA	6250
6251	CACATGGCAT	GGATGAACTA	TACAAATAAG	GCGCGCCTAT	TCTAAATGCA	6300
6301	TAATAAATAC	TGATAACATC	TTATATTTTG	TATTATATTT	TGTATTATCG	6350
6351	TTGACATGTA	TAATTTTGAT	ATCAAAAACT	GATTTTCCCT	CTATTATTTT	6400
6401	CGAGATTTAT	TTTCTTAATT	CTCTTTAACA	AACTAGAAAT	ATTGTATATA	6450
6451	CAAAAAATTA	TAAATAATAG	ATGAATAGTT	TAATTATAGG	TGTTTATCAA	6500
6501	TCGAAAAAGC	AACGTATCTT	ATTTAAAGTG	CGTTGCTTTT	TTCTCATTTA	6550
6551	TAAGGTTAAA	TAATTCTCAT	ATATCAAGCA	AAGTGACAGG	CG	6592