```
     1  GACGGATCGG GAGATCTCCC GATCCCCTAT GGTGCACTCT CAGTACAATC
        CTGCCTAGCC CTCTAGAGGG CTAGGGGATA CCACGTGAGA GTCATGTTAG

    51  TGCTCTGATG CCGCATAGTT AAGCCAGTAT CTGCTCCCTG CTTGTGTGTT
        ACGAGACTAC GGCGTATCAA TTCGGTCATA GACGAGGGAC GAACACACAA

   101  GGAGGTCGCT GAGTAGTGCG CGAGCAAAAT TTAAGCTACA ACAAGGCAAG
        CCTCCAGCGA CTCATCACGC GCTCGTTTTA AATTCGATGT TGTTCCGTTC

   151  GCTTGACCGA CAATTGCATG AAGAATCTGC TTAGGGTTAG GCGTTTTGCG
        CGAACTGGCT GTTAACGTAC TTCTTAGACG AATCCCAATC CGCAAAACGC

                                  CMV promoter
   201  CTGCTTCGCG ATGTACGGGC CAGATATACG CGTTGACATT GATTATTGAC
        GACGAAGCGC TACATGCCCG GTCTATATGC GCAACTGTAA CTAATAACTG

                CMV promoter
   251  TAGTTATTAA TAGTAATCAA TTACGGGGTC ATTAGTTCAT AGCCCATATA
        ATCAATAATT ATCATTAGTT AATGCCCCAG TAATCAAGTA TCGGGTATAT

                CMV promoter
   301  TGGAGTTCCG CGTTACATAA CTTACGGTAA ATGGCCCGCC TGGCTGACCG
        ACCTCAAGGC GCAATGTATT GAATGCCATT TACCGGGCGG ACCGACTGGC

                CMV promoter
   351  CCCAACGACC CCCGCCCATT GACGTCAATA ATGACGTATG TTCCCATAGT
        GGGTTGCTGG GGGCGGGTAA CTGCAGTTAT TACTGCATAC AAGGGTATCA

                CMV promoter
   401  AACGCCAATA GGGACTTTCC ATTGACGTCA ATGGGTGGAG TATTTACGGT
        TTGCGGTTAT CCCTGAAAGG TAACTGCAGT TACCCACCTC ATAAATGCCA

                CMV promoter
   451  AAACTGCCCA CTTGGCAGTA CATCAAGTGT ATCATATGCC AAGTACGCCC
        TTTGACGGGT GAACCGTCAT GTAGTTCACA TAGTATACGG TTCATGCGGG

                CMV promoter
   501  CCTATTGACG TCAATGACGG TAAATGGCCC GCCTGGCATT ATGCCCAGTA
        GGATAACTGC AGTTACTGCC ATTTACCGGG CGGACCGTAA TACGGGTCAT

                CMV promoter
   551  CATGACCTTA TGGGACTTTC CTACTTGGCA GTACATCTAC GTATTAGTCA
        GTACTGGAAT ACCCTGAAAG GATGAACCGT CATGTAGATG CATAATCAGT

                CMV promoter
   601  TCGCTATTAC CATGGTGATG CGGTTTTGGC AGTACATCAA TGGGCGTGGA
        AGCGATAATG GTACCACTAC GCCAAAACCG TCATGTAGTT ACCCGCACCT

                CMV promoter
   651  TAGCGGTTTG ACTCACGGGG ATTTCCAAGT CTCCACCCCA TTGACGTCAA
        ATCGCCAAAC TGAGTGCCCC TAAAGGTTCA GAGGTGGGGT AACTGCAGTT

                CMV promoter
   701  TGGGAGTTTG TTTTGGCACC AAAATCAACG GGACTTTCCA AAATGTCGTA
        ACCCTCAAAC AAAACCGTGG TTTTAGTTGC CCTGAAAGGT TTTACAGCAT

                CMV promoter
   751  ACAACTCCGC CCCATTGACG CAAATGGGCG GTAGGCGTGT ACGGTGGGAG
        TGTTGAGGCG GGGTAACTGC GTTTACCCGC CATCCGCACA TGCCACCCTC

                CMV promoter
   801  GTCTATATAA GCAGAGCTCT CTGGCTAACT AGAGAACCCA CTGCTTACTG
        CAGATATATT CGTCTCGAGA GACCGATTGA TCTCTTGGGT GACGAATGAC
```

T7
CMV promoter
851 GCTTATCGAA ATTAATACGA CTCACTATAG GGAGACCCAA GCTGGCTAGC
CGAATAGCTT TAATTATGCT GAGTGATATC CCTCTGGGTT CGACCGATCG

901 GTTTAAACGG GCCCTCTAGA CTCGAGCGGC CGCCACTGTG CTGGATATCT
CAAATTTGCC CGGGAGATCT GAGCTCGCCG GCGGTGACAC GACCTATAGA

IDH1
EcoRI
951 GCAGAATTCA TGTCCAAAAA AATCAGTGGC GGTTCTGTGG TAGAGATGCA
CGTCTTAAGT ACAGGTTTTT TTAGTCACCG CCAAGACACC ATCTCTACGT

IDH1
1001 AGGAGATGAA ATGACACGAA TCATTTGGGA ATTGATTAAA GAGAAACTCA
TCCTCTACTT TACTGTGCTT AGTAAACCCT TAACTAATTT CTCTTTGAGT

IDH1
1051 TTTTTCCCTA CGTGGAATTG GATCTACATA GCTATGATTT AGGCATAGAG
AAAAAGGGAT GCACCTTAAC CTAGATGTAT CGATACTAAA TCCGTATCTC

IDH1
1101 AATCGTGATG CCACCAACGA CCAAGTCACC AAGGATGCTG CAGAAGCTAT
TTAGCACTAC GGTGGTTGCT GGTTCAGTGG TTCCTACGAC GTCTTCGATA

IDH1
1151 AAAGAAGCAT AATGTTGGCG TCAAATGTGC CACTATCACT CCTGATGAGA
TTTCTTCGTA TTACAACCGC AGTTTACACG GTGATAGTGA GGACTACTCT

IDH1
1201 AGAGGGTTGA GGAGTTCAAG TTGAAACAAA TGTGGAAATC ACCAAATGGC
TCTCCCAACT CCTCAAGTTC AACTTTGTTT ACACCTTTAG TGGTTTACCG

IDH1
1251 ACCATACGAA ATATTCTGGG TGGCACGGTC TTCAGAGAAG CCATTATCTG
TGGTATGCTT TATAAGACCC ACCGTGCCAG AAGTCTCTTC GGTAATAGAC

IDH1
1301 CAAAAATATC CCCCGGCTTG TGAGTGGATG GGTAAAACCT ATCATCATAG
GTTTTTATAG GGGGCCGAAC ACTCACCTAC CCATTTTGGA TAGTAGTATC

IDH1
1351 GTCGTCATGC TTATGGGGAT CAATACAGAG CAACTGATTT TGTTGTTCCT
CAGCAGTACG AATACCCCTA GTTATGTCTC GTTGACTAAA ACAACAAGGA

IDH1
1401 GGGCCTGGAA AAGTAGAGAT AACCTACACA CCAAGTGACG GAACCCAAAA
CCCGGACCTT TTCATCTCTA TTGGATGTGT GGTTCACTGC CTTGGGTTTT

IDH1
1451 GGTGACATAC CTGGTACATA ACTTTGAAGA AGGTGGTGGT GTTGCCATGG
CCACTGTATG GACCATGTAT TGAAACTTCT TCCACCACCA CAACGGTACC

IDH1
1501 GGATGTATAA TCAAGATAAG TCAATTGAAG ATTTTGCACA CAGTTCCTTC
CCTACATATT AGTTCTATTC AGTTAACTTC TAAAACGTGT GTCAAGGAAG

IDH1
1551 CAAATGGCTC TGTCTAAGGG TTGGCCTTTG TATCTGAGCA CCAAAAACAC
GTTTACCGAG ACAGATTCCC AACCGGAAAC ATAGACTCGT GGTTTTTGTG

IDH1
1601 TATTCTGAAG AAATATGATG GGCGTTTTAA AGACATCTTT CAGGAGATAT
ATAAGACTTC TTTATACTAC CCGCAAAATT TCTGTAGAAA GTCCTCTATA

IDH1

1651 ATGACAAGCA GTACAAGTCC CAGTTTGAAG CTCAAAAGAT CTGGTATGAG
TACTGTTCGT CATGTTCAGG GTCAAACTTC GAGTTTTCTA GACCATACTC

IDH1

1701 CATAGGCTCA TCGACGACAT GGTGGCCCAA GCTATGAAAT CAGAGGGAGG
GTATCCGAGT AGCTGCTGTA CCACCGGGTT CGATACTTTA GTCTCCCTCC

IDH1

1751 CTTCATCTGG GCCTGTAAAA ACTATGATGG TGACGTGCAG TCGGACTCTG
GAAGTAGACC CGGACATTTT TGATACTACC ACTGCACGTC AGCCTGAGAC

IDH1

1801 TGGCCCAAGG GTATGGCTCT CTCGGCATGA TGACCAGCGT GCTGGTTTGT
ACCGGGTTCC CATACCGAGA GAGCCGTACT ACTGGTCGCA CGACCAAACA

IDH1

1851 CCAGATGGCA AGACAGTAGA AGCAGAGGCT GCCCACGGGA CTGTAACCCG
GGTCTACCGT TCTGTCATCT TCGTCTCCGA CGGGTGCCCT GACATTGGGC

IDH1

1901 TCACTACCGC ATGTACCAGA AAGGACAGGA GACGTCCACC AATCCCATTG
AGTGATGGCG TACATGGTCT TTCCTGTCCT CTGCAGGTGG TTAGGGTAAC

IDH1

1951 CTTCCATTTT TGCCTGGACC AGAGGGTTAG CCCACAGAGC AAAGCTTGAT
GAAGGTAAAA ACGGACCTGG TCTCCCAATC GGGTGTCTCG TTTCGAACTA

IDH1

2001 AACAATAAAG AGCTTGCCTT CTTTGCAAAT GCTTTGGAAG AAGTCTCTAT
TTGTTATTTC TCGAACGGAA GAAACGTTTA CGAAACCTTC TTCAGAGATA

IDH1

2051 TGAGACAATT GAGGCTGGCT TCATGACCAA GGACTTGGCT GCTTGCATTA
ACTCTGTTAA CTCCGACCGA AGTACTGGTT CCTGAACCGA CGAACGTAAT

IDH1

2101 AAGGTTTACC CAATGTGCAA CGTTCTGACT ACTTGAATAC ATTTGAGTTC
TTCCAAATGG GTTACACGTT GCAAGACTGA TGAACTTATG TAAACTCAAG

IDH1

2151 ATGGATAAAC TTGGAGAAAA CTTGAAGATC AAACTAGCTC AGGCCAAACT
TACCTATTTG AACCTCTTTT GAACTTCTAG TTTGATCGAG TCCGGTTTGA

IDH1 BamHI Flag

2201 TGTGGATCCC GATTACAAGG ATGACGACGA TAAGTAGAAG CTTTCTAGAA
ACACCTAGGG CTAATGTTCC TACTGCTGCT ATTCATCTTC GAAAGATCTT

2251 CAAAAACTCA TCTCAGAAGA GGATCTGAAT AGCGCCGTCG ACCATCATCA
GTTTTTGAGT AGAGTCTTCT CCTAGACTTA TCGCGGCAGC TGGTAGTAGT

2301 TCATCATCAT TGAGTTTAAA CGGTCTCCAG CTTAAGTTTA AACCGCTGAT
AGTAGTAGTA ACTCAAATTT GCCAGAGGTC GAATTCAAAT TTGGCGACTA

BGH pA

2351 CAGCCTCGAC TGTGCCTTCT AGTTGCCAGC CATCTGTTGT TTGCCCCTCC
GTCGGAGCTG ACACGGAAGA TCAACGGTCG GTAGACAACA AACGGGGAGG

BGH

BGH pA

2401 CCCGTGCCTT CCTTGACCCT GGAAGGTGCC ACTCCCACTG TCCTTTCCTA
GGGCACGGAA GGAACTGGGA CCTTCCACGG TGAGGGTGAC AGGAAAGGAT

BGH pA
2451 ATAAAATGAG GAAATTGCAT CGCATTGTCT GAGTAGGTGT CATTCTATTC
TATTTTACTC CTTTAACGTA GCGTAACAGA CTCATCCACA GTAAGATAAG

BGH pA
2501 TGGGGGGTGG GGTGGGGCAG GACAGCAAGG GGGAGGATTG GGAAGACAAT
ACCCCCCACC CCACCCCGTC CTGTCGTTCC CCCTCCTAAC CCTTCTGTTA

BGH pA
2551 AGCAGGCATG CTGGGGATGC GGTGGGCTCT ATGGCTTCTG AGGCGGAAAG
TCGTCCGTAC GACCCCTACG CCACCCGAGA TACCGAAGAC TCCGCCTTTC

f1 ori
2601 AACCAGCTGG GGCTCTAGGG GGTATCCCCA CGCGCCCTGT AGCGGCGCAT
TTGGTCGACC CCGAGATCCC CCATAGGGGT GCGCGGGACA TCGCCGCGTA

f1 ori
2651 TAAGCGCGGC GGGTGTGGTG GTTACGCGCA GCGTGACCGC TACACTTGCC
ATTCGCGCCG CCCACACCAC CAATGCGCGT CGCACTGGCG ATGTGAACGG

f1 ori
2701 AGCGCCCTAG CGCCCGCTCC TTTCGCTTTC TTCCCTTCCT TTCTCGCCAC
TCGCGGGATC GCGGGCGAGG AAAGCGAAAG AAGGGAAGGA AAGAGCGGTG

f1 ori
2751 GTTCGCCGGC TTTCCCCGTC AAGCTCTAAA TCGGGGGCTC CCTTTAGGGT
CAAGCGGCCG AAAGGGGCAG TTCGAGATTT AGCCCCCGAG GGAAATCCCA

f1 ori
2801 TCCGATTTAG TGCTTTACGG CACCTCGACC CCAAAAAACT TGATTAGGGT
AGGCTAAATC ACGAAATGCC GTGGAGCTGG GGTTTTTTGA ACTAATCCCA

f1 ori
2851 GATGGTTCAC GTAGTGGGCC ATCGCCCTGA TAGACGGTTT TTCGCCCTTT
CTACCAAGTG CATCACCCGG TAGCGGGACT ATCTGCCAAA AAGCGGGAAA

f1 ori
2901 GACGTTGGAG TCCACGTTCT TTAATAGTGG ACTCTTGTTC CAAACTGGAA
CTGCAACCTC AGGTGCAAGA AATTATCACC TGAGAACAAG GTTTGACCTT

f1 ori
2951 CAACACTCAA CCCTATCTCG GTCTATTCTT TTGATTTATA AGGGATTTTG
GTTGTGAGTT GGGATAGAGC CAGATAAGAA AACTAAATAT TCCCTAAAAC

f1 ori
3001 CCGATTTCGG CCTATTGGTT AAAAAATGAG CTGATTTAAC AAAAATTTAA
GGCTAAAGCC GGATAACCAA TTTTTTACTC GACTAAATTG TTTTTAAATT

f1 ori SV40 ori
3051 CGCGAATTAA TTCTGTGGAA TGTGTGTCAG TTAGGGTGTG GAAAGTCCCC
GCGCTTAATT AAGACACCTT ACACACAGTC AATCCCACAC CTTTCAGGGG

SV40 ori
3101 AGGCTCCCCA GCAGGCAGAA GTATGCAAAG CATGCATCTC AATTAGTCAG
TCCGAGGGGT CGTCCGTCTT CATACGTTTC GTACGTAGAG TTAATCAGTC

SV40 ori
3151 CAACCAGGTG TGGAAAGTCC CCAGGCTCCC CAGCAGGCAG AAGTATGCAA
GTTGGTCCAC ACCTTTCAGG GGTCCGAGGG GTCGTCCGTC TTCATACGTT

SV40 ori
3201 AGCATGCATC TCAATTAGTC AGCAACCATA GTCCCGCCCC TAACTCCGCC
TCGTACGTAG AGTTAATCAG TCGTTGGTAT CAGGGCGGGG ATTGAGGCGG

SV40 ori

3251 CATCCCGCCC CTAACTCCGC CCAGTTCCGC CCATTCTCCG CCCCATGGCT
GTAGGGCGGG GATTGAGGCG GGTCAAGGCG GGTAAGAGGC GGGGTACCGA

SV40 ori

3301 GACTAATTTT TTTTATTTAT GCAGAGGCCG AGGCCGCCTC TGCCTCTGAG
CTGATTAAAA AAAATAAATA CGTCTCCGGC TCCGGCGGAG ACGGAGACTC

SV40 ori

3351 CTATTCCAGA AGTAGTGAGG AGGCTTTTTT GGAGGCCTAG GCTTTTGCAA
GATAAGGTCT TCATCACTCC TCCGAAAAAA CCTCCGGATC CGAAAACGTT

3401 AAAGCTCCCG GGAGCTTGTA TATCCATTTT CGGATCTGAT CAAGAGACAG
TTTCGAGGGC CCTCGAACAT ATAGGTAAAA GCCTAGACTA GTTCTCTGTC

Neo(R)

3451 GATGAGGATC GTTTCGCATG ATTGAACAAG ATGGATTGCA CGCAGGTTCT
CTACTCCTAG CAAAGCGTAC TAACTTGTTC TACCTAACGT GCGTCCAAGA

Neo(R)

3501 CCGGCCGCTT GGGTGGAGAG GCTATTCGGC TATGACTGGG CACAACAGAC
GGCCGGCGAA CCCACCTCTC CGATAAGCCG ATACTGACCC GTGTTGTCTG

Neo(R)

3551 AATCGGCTGC TCTGATGCCG CCGTGTTCCG GCTGTCAGCG CAGGGGCGCC
TTAGCCGACG AGACTACGGC GGCACAAGGC CGACAGTCGC GTCCCCGCGG

Neo(R)

3601 CGGTTCTTTT TGTCAAGACC GACCTGTCCG GTGCCCTGAA TGAACTGCAG
GCCAAGAAAA ACAGTTCTGG CTGGACAGGC CACGGGACTT ACTTGACGTC

Neo(R)

3651 GACGAGGCAG CGCGGCTATC GTGGCTGGCC ACGACGGGCG TTCCTTGCGC
CTGCTCCGTC GCGCCGATAG CACCGACCGG TGCTGCCCGC AAGGAACGCG

Neo(R)

3701 AGCTGTGCTC GACGTTGTCA CTGAAGCGGG AAGGGACTGG CTGCTATTGG
TCGACACGAG CTGCAACAGT GACTTCGCCC TTCCCTGACC GACGATAACC

Neo(R)

3751 GCGAAGTGCC GGGGCAGGAT CTCCTGTCAT CTCACCTTGC TCCTGCCGAG
CGCTTCACGG CCCCGTCCTA GAGGACAGTA GAGTGGAACG AGGACGGCTC

Neo(R)

3801 AAAGTATCCA TCATGGCTGA TGCAATGCGG CGGCTGCATA CGCTTGATCC
TTTCATAGGT AGTACCGACT ACGTTACGCC GCCGACGTAT GCGAACTAGG

Neo(R)

3851 GGCTACCTGC CCATTCGACC ACCAAGCGAA ACATCGCATC GAGCGAGCAC
CCGATGGACG GGTAAGCTGG TGGTTCGCTT TGTAGCGTAG CTCGCTCGTG

Neo(R)

3901 GTACTCGGAT GGAAGCCGGT CTTGTCGATC AGGATGATCT GGACGAAGAG
CATGAGCCTA CCTTCGGCCA GAACAGCTAG TCCTACTAGA CCTGCTTCTC

Neo(R)

3951 CATCAGGGGC TCGCGCCAGC CGAACTGTTC GCCAGGCTCA AGGCGCGCAT
GTAGTCCCCG AGCGCGGTCG GCTTGACAAG CGGTCCGAGT TCCGCGCGTA

Neo(R)

4001 GCCCGACGGC GAGGATCTCG TCGTGACCCA TGGCGATGCC TGCTTGCCGA
CGGGCTGCCG CTCCTAGAGC AGCACTGGGT ACCGCTACGG ACGAACGGCT

Neo(R)

```
4051  ATATCATGGT GGAAAATGGC CGCTTTTCTG GATTCATCGA CTGTGGCCGG
      TATAGTACCA CCTTTTACCG GCGAAAAGAC CTAAGTAGCT GACACCGGCC
```

Neo(R)

```
4101  CTGGGTGTGG CGGACCGCTA TCAGGACATA GCGTTGGCTA CCCGTGATAT
      GACCCACACC GCCTGGCGAT AGTCCTGTAT CGCAACCGAT GGGCACTATA
```

Neo(R)

```
4151  TGCTGAAGAG CTTGGCGGCG AATGGGCTGA CCGCTTCCTC GTGCTTTACG
      ACGACTTCTC GAACCGCCGC TTACCCGACT GGCGAAGGAG CACGAAATGC
```

Neo(R)

```
4201  GTATCGCCGC TCCCGATTCG CAGCGCATCG CCTTCTATCG CCTTCTTGAC
      CATAGCGGCG AGGGCTAAGC GTCGCGTAGC GGAAGATAGC GGAAGAACTG
```

Neo(R)

```
4251  GAGTTCTTCT GAGCGGGACT CTGGGGTTCG AAATGACCGA CCAAGCGACG
      CTCAAGAAGA CTCGCCCTGA GACCCCAAGC TTTACTGGCT GGTTCGCTGC
```

```
4301  CCCAACCTGC CATCACGAGA TTTCGATTCC ACCGCCGCCT TCTATGAAAG
      GGGTTGGACG GTAGTGCTCT AAAGCTAAGG TGGCGGCGGA AGATACTTTC
```

```
4351  GTTGGGCTTC GGAATCGTTT TCCGGGACGC CGGCTGGATG ATCCTCCAGC
      CAACCCGAAG CCTTAGCAAA AGGCCCTGCG GCCGACCTAC TAGGAGGTCG
```

SV40 pA

```
4401  GCGGGGATCT CATGCTGGAG TTCTTCGCCC ACCCCAACTT GTTTATTGCA
      CGCCCCTAGA GTACGACCTC AAGAAGCGGG TGGGGTTGAA CAAATAACGT
```

SV40 pA

```
4451  GCTTATAATG GTTACAAATA AAGCAATAGC ATCACAAATT TCACAAATAA
      CGAATATTAC CAATGTTTAT TTCGTTATCG TAGTGTTTAA AGTGTTTATT
```

SV40 pA

```
4501  AGCATTTTTT TCACTGCATT CTAGTTGTGG TTTGTCCAAA CTCATCAATG
      TCGTAAAAAA AGTGACGTAA GATCAACACC AAACAGGTTT GAGTAGTTAC
```

SV40 pA

```
4551  TATCTTATCA TGTCTGTATA CCGTCGACCT CTAGCTAGAG CTTGGCGTAA
      ATAGAATAGT ACAGACATAT GGCAGCTGGA GATCGATCTC GAACCGCATT
```

```
4601  TCATGGTCAT AGCTGTTTCC TGTGTGAAAT TGTTATCCGC TCACAATTCC
      AGTACCAGTA TCGACAAAGG ACACACTTTA ACAATAGGCG AGTGTTAAGG
```

```
4651  ACACAACATA CGAGCCGGAA GCATAAAGTG TAAAGCCTGG GGTGCCTAAT
      TGTGTTGTAT GCTCGGCCTT CGTATTTCAC ATTTCGGACC CCACGGATTA
```

```
4701  GAGTGAGCTA ACTCACATTA ATTGCGTTGC GCTCACTGCC CGCTTTCCAG
      CTCACTCGAT TGAGTGTAAT TAACGCAACG CGAGTGACGG GCGAAAGGTC
```

```
4751  TCGGGAAACC TGTCGTGCCA GCTGCATTAA TGAATCGGCC AACGCGCGGG
      AGCCCTTTGG ACAGCACGGT CGACGTAATT ACTTAGCCGG TTGCGCGCCC
```

```
4801  GAGAGGCGGT TTGCGTATTG GGCGCTCTTC CGCTTCCTCG CTCACTGACT
      CTCTCCGCCA AACGCATAAC CCGCGAGAAG GCGAAGGAGC GAGTGACTGA
```

```
4851  CGCTGCGCTC GGTCGTTCGG CTGCGGCGAG CGGTATCAGC TCACTCAAAG
      GCGACGCGAG CCAGCAAGCC GACGCCGCTC GCCATAGTCG AGTGAGTTTC
```

```
4901  GCGGTAATAC GGTTATCCAC AGAATCAGGG GATAACGCAG GAAAGAACAT
      CGCCATTATG CCAATAGGTG TCTTAGTCCC CTATTGCGTC CTTTCTTGTA
```

pUC ori

```
4951  GTGAGCAAAA GGCCAGCAAA AGGCCAGGAA CCGTAAAAAG GCCGCGTTGC
      CACTCGTTTT CCGGTCGTTT TCCGGTCCTT GGCATTTTTC CGGCGCAACG
```

pUC ori

```
5001   TGGCGTTTTT CCATAGGCTC CGCCCCCCTG ACGAGCATCA CAAAAATCGA
       ACCGCAAAAA GGTATCCGAG GCGGGGGGAC TGCTCGTAGT GTTTTTAGCT
```

pUC ori

```
5051   CGCTCAAGTC AGAGGTGGCG AAACCCGACA GGACTATAAA GATACCAGGC
       GCGAGTTCAG TCTCCACCGC TTTGGGCTGT CCTGATATTT CTATGGTCCG
```

pUC ori

```
5101   GTTTCCCCCT GGAAGCTCCC TCGTGCGCTC TCCTGTTCCG ACCCTGCCGC
       CAAAGGGGGA CCTTCGAGGG AGCACGCGAG AGGACAAGGC TGGGACGGCG
```

pUC ori

```
5151   TTACCGGATA CCTGTCCGCC TTTCTCCCTT CGGGAAGCGT GGCGCTTTCT
       AATGGCCTAT GGACAGGCGG AAAGAGGGAA GCCCTTCGCA CCGCGAAAGA
```

pUC ori

```
5201   CATAGCTCAC GCTGTAGGTA TCTCAGTTCG GTGTAGGTCG TTCGCTCCAA
       GTATCGAGTG CGACATCCAT AGAGTCAAGC CACATCCAGC AAGCGAGGTT
```

pUC ori

```
5251   GCTGGGCTGT GTGCACGAAC CCCCCGTTCA GCCCGACCGC TGCGCCTTAT
       CGACCCGACA CACGTGCTTG GGGGGCAAGT CGGGCTGGCG ACGCGGAATA
```

pUC ori

```
5301   CCGGTAACTA TCGTCTTGAG TCCAACCCGG TAAGACACGA CTTATCGCCA
       GGCCATTGAT AGCAGAACTC AGGTTGGGCC ATTCTGTGCT GAATAGCGGT
```

pUC ori

```
5351   CTGGCAGCAG CCACTGGTAA CAGGATTAGC AGAGCGAGGT ATGTAGGCGG
       GACCGTCGTC GGTGACCATT GTCCTAATCG TCTCGCTCCA TACATCCGCC
```

pUC ori

```
5401   TGCTACAGAG TTCTTGAAGT GGTGGCCTAA CTACGGCTAC ACTAGAAGAA
       ACGATGTCTC AAGAACTTCA CCACCGGATT GATGCCGATG TGATCTTCTT
```

pUC ori

```
5451   CAGTATTTGG TATCTGCGCT CTGCTGAAGC CAGTTACCTT CGGAAAAAGA
       GTCATAAACC ATAGACGCGA GACGACTTCG GTCAATGGAA GCCTTTTTCT
```

pUC ori

```
5501   GTTGGTAGCT CTTGATCCGG CAAACAAACC ACCGCTGGTA GCGGTGGTTT
       CAACCATCGA GAACTAGGCC GTTTGTTTGG TGGCGACCAT CGCCACCAAA
```

pUC ori

```
5551   TTTTGTTTGC AAGCAGCAGA TTACGCGCAG AAAAAAAGGA TCTCAAGAAG
       AAAACAAACG TTCGTCGTCT AATGCGCGTC TTTTTTTCCT AGAGTTCTTC
```

pUC ori

```
5601   ATCCTTTGAT CTTTTCTACG GGGTCTGACG CTCAGTGGAA CGAAAACTCA
       TAGGAAACTA GAAAAGATGC CCCAGACTGC GAGTCACCTT GCTTTTGAGT
```

```
5651   CGTTAAGGGA TTTTGGTCAT GAGATTATCA AAAAGGATCT TCACCTAGAT
       GCAATTCCCT AAAACCAGTA CTCTAATAGT TTTTCCTAGA AGTGGATCTA
```

```
5701   CCTTTTAAAT TAAAAATGAA GTTTTAAATC AATCTAAAGT ATATATGAGT
       GGAAAATTTA ATTTTTACTT CAAAATTTAG TTAGATTTCA TATATACTCA
```

```
5751   AAACTTGGTC TGACAGTTAC CAATGCTTAA TCAGTGAGGC ACCTATCTCA
       TTTGAACCAG ACTGTCAATG GTTACGAATT AGTCACTCCG TGGATAGAGT
```

Amp(R)

```
5801   GCGATCTGTC TATTTCGTTC ATCCATAGTT GCCTGACTCC CCGTCGTGTA
       CGCTAGACAG ATAAAGCAAG TAGGTATCAA CGGACTGAGG GGCAGCACAT
```

Amp(R)

```
5851  GATAACTACG ATACGGGAGG GCTTACCATC TGGCCCCAGT GCTGCAATGA
      CTATTGATGC TATGCCCTCC CGAATGGTAG ACCGGGGTCA CGACGTTACT
                          Amp(R)
5901  TACCGCGAGA CCCACGCTCA CCGGCTCCAG ATTTATCAGC AATAAACCAG
      ATGGCGCTCT GGGTGCGAGT GGCCGAGGTC TAAATAGTCG TTATTTGGTC
                          Amp(R)
5951  CCAGCCGGAA GGGCCGAGCG CAGAAGTGGT CCTGCAACTT TATCCGCCTC
      GGTCGGCCTT CCCGGCTCGC GTCTTCACCA GGACGTTGAA ATAGGCGGAG
                          Amp(R)
6001  CATCCAGTCT ATTAATTGTT GCCGGGAAGC TAGAGTAAGT AGTTCGCCAG
      GTAGGTCAGA TAATTAACAA CGGCCCTTCG ATCTCATTCA TCAAGCGGTC
                          Amp(R)
6051  TTAATAGTTT GCGCAACGTT GTTGCCATTG CTACAGGCAT CGTGGTGTCA
      AATTATCAAA CGCGTTGCAA CAACGGTAAC GATGTCCGTA GCACCACAGT
                          Amp(R)
6101  CGCTCGTCGT TTGGTATGGC TTCATTCAGC TCCGGTTCCC AACGATCAAG
      GCGAGCAGCA AACCATACCG AAGTAAGTCG AGGCCAAGGG TTGCTAGTTC
                          Amp(R)
6151  GCGAGTTACA TGATCCCCCA TGTTGTGCAA AAAAGCGGTT AGCTCCTTCG
      CGCTCAATGT ACTAGGGGGT ACAACACGTT TTTTCGCCAA TCGAGGAAGC
                          Amp(R)
6201  GTCCTCCGAT CGTTGTCAGA AGTAAGTTGG CCGCAGTGTT ATCACTCATG
      CAGGAGGCTA GCAACAGTCT TCATTCAACC GGCGTCACAA TAGTGAGTAC
                          Amp(R)
6251  GTTATGGCAG CACTGCATAA TTCTCTTACT GTCATGCCAT CCGTAAGATG
      CAATACCGTC GTGACGTATT AAGAGAATGA CAGTACGGTA GGCATTCTAC
                          Amp(R)
6301  CTTTTCTGTG ACTGGTGAGT ACTCAACCAA GTCATTCTGA GAATAGTGTA
      GAAAAGACAC TGACCACTCA TGAGTTGGTT CAGTAAGACT CTTATCACAT
                          Amp(R)
6351  TGCGGCGACC GAGTTGCTCT TGCCCGGCGT CAATACGGGA TAATACCGCG
      ACGCCGCTGG CTCAACGAGA ACGGGCCGCA GTTATGCCCT ATTATGGCGC
                          Amp(R)
6401  CCACATAGCA GAACTTTAAA AGTGCTCATC ATTGGAAAAC GTTCTTCGGG
      GGTGTATCGT CTTGAAATTT TCACGAGTAG TAACCTTTTG CAAGAAGCCC
                          Amp(R)
6451  GCGAAAACTC TCAAGGATCT TACCGCTGTT GAGATCCAGT TCGATGTAAC
      CGCTTTTGAG AGTTCCTAGA ATGGCGACAA CTCTAGGTCA AGCTACATTG
                          Amp(R)
6501  CCACTCGTGC ACCCAACTGA TCTTCAGCAT CTTTTACTTT CACCAGCGTT
      GGTGAGCACG TGGGTTGACT AGAAGTCGTA GAAAATGAAA GTGGTCGCAA
                          Amp(R)
6551  TCTGGGTGAG CAAAAACAGG AAGGCAAAAT GCCGCAAAAA AGGGAATAAG
      AGACCCACTC GTTTTTGTCC TTCCGTTTTA CGGCGTTTTT TCCCTTATTC
                          Amp(R)
6601  GGCGACACGG AAATGTTGAA TACTCATACT CTTCCTTTTT CAATATTATT
      CCGCTGTGCC TTTACAACTT ATGAGTATGA GAAGGAAAAA GTTATAATAA
                    Amp(R)
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6651  GAAGCATTTA TCAGGGTTAT TGTCTCATGA GCGGATACAT ATTTGAATGT
      CTTCGTAAAT AGTCCCAATA ACAGAGTACT CGCCTATGTA TAAACTTACA

6701  ATTTAGAAAA ATAAACAAAT AGGGGTTCCG CGCACATTTC CCCGAAAAGT
      TAAATCTTTT TATTTGTTTA TCCCCAAGGC GCGTGTAAAG GGGCTTTTCA

6751  GCCACCTGAC GTC
      CGGTGGACTG CAG
```