

5'LTR 20 40 60 80
TGAAAGACCCACCTGTAGGTTGGCAAGCTAGCTTAAGTAACGCCATTTTGAAGGCATGGAAAATACATAACTGAGAATAGAGAAGTTCA
ACTTTCTGGGGTGGACATCCAAACCGTTCGATCGAATTCATTGCGGTAAAACGTTCCGTACCTTTTATGTATTGACTCTTATCTCTTCAAGT

5'LTR 100 120 140 160 180
GATCAAGGTTAGGAACAGAGAGACAGCAGAATATGGGCCAAACAGGATATCTGTGGTAAGCAGTTCTGCCCCGGCTCAGGGCCAAGAACAG
CTAGTTCCAATCCTTGTCTCTGTGCTTATACCCGGTTGTCTATAGACACCATTCGTCAAGGACGGGGCCGAGTCCCGGTTCTTGTCT

5'LTR 200 220 240 260
ATGGTCCCAGATGCGGTCCCGCCCTCAGCAGTTTCTAGAGAACCATCAGATGTTTCCAGGGTGCCCCAAGGACCTGAAATGACCCTGTGCC
TACCAGGGGTCTACGCCAGGGCGGGAGTCGTCAAAGATCTCTTGGTAGTCTACAAAGTCCCACGGGGTCTCTGGACTTTACTGGGACACGG

5'LTR₃₂₀ 300 320 340 360
TTATTTGAACTAACCAATCAGTTTCGCTTCTCGCTTCTGTTTCGCGGGCTTCTGCTCCCCGAGCTCAATAAAAGAGCCACAACCCCTCACTCG
AATAAACCCTTGATTGGTTAGTCAAGCGAAGAGCGAAGACAAGCGCGGAAGACGAGGGGCTCGAGTTATTTCTCGGGTGTGGGGAGTGAGC

5'LTR 380 400 420 440 460
GCGCGCCAGTCTCCGATAGACTGCGTCGCCCGGGTACCCGTATTCCTAAAGCCCTTTGCTGTTTGCAATCCGAATCGTGGACTCGCTGA
CGCGCGGTCAGGAGGCTATCTGACGCAGCGGGCCCATGGGCATAAAGGTTATTTCCGAGAACGACAAAACGTAGGCTTAGCACCTGAGCGACT

5'LTR 480 500 520 540
TCTTTGGGAGGGTCTCTCAGATTGATTGACTGCCACCTCGGGGGTCTTTCAATTTGGAGGTTCCACCGAGATTTGGAGACCCCTGCCCAGG
AGGAACCTCCCAGAGGAGTCTAACTAACTGACGGGTGGAGCCCCAGAAAGTAAACCTCCAAGGTGGCTCTAAACCTCTGGGGACGGGTCC

Psi 560 580 600 620 640
GACCACCGACCCCGCCGGGAGGTAAGCTGGCCAGCGGTCTTTTCGTGTCTGTCTCTGCTTTGTGCGTGTGTTGTGCCGGCATCTAATGT
CTGGTGGCTGGGGGGGGCCCTCCATTCGACCGGTCCGACGAAAGCACAGACAGAGACAGAAAACACGCACAAAACAGGCCGTAGATTACA

Psi 660 680 700 720
TTGCGCTGCGTCTGTAAGTACTAGCTAAGTCTGTATCTGGCGGACCCGTGGTGGAACTGACGAGTTCTGAACACCCGGCCGCAACCC
AACGGGACGCAGACATGATCAATCGATTGATCGAGACATAGACCGCTGGGCACCACCTTGACTGCTCAAGACTTGTGGCCGGCGTGGG

Psi 740 760 780 800 820
TGGGAGACGTCCCAGGGACTTTGGGGGCGTTTTTGTGGCCGACCTGAGGAAGGGAGTCGATGTGGAATCCGACCCCGTCAGGATATGTGG
ACCCTCTGACGGTCCCTGAAACCCCGGCAAAAACACCGGGCTGGACTCCTTCCCTCAGCTACACCTTAGGCTGGGGCAGTCTATACACC

Psi 840 860 880 900 920
TTCTGGTAGGAGACGAGAACCTAAAACAGTTCGGCCTCCGTCTGAATTTTTGCTTTTCGGTTTGGAAACGAAGCCGGCGTCTTGTCTGCTG
AAGACCATCTCTGCTCTTGGATTTGTCAAGGGCGGAGGCAGACTTAAAACGAAAGCCAAACCTTGCTTCGGCGCGCAGAACAGACGAC

Psi 940 960 980 1000
CAGCGTGCAGCATGTTCTGTGTTGCTCTGCTGACTGTGTTTTCTGTATTTGCTGAAAATTAGGGCCAGACTGTTACCACCTCCCTTAAG
GTCGCGACGTCGTAGCAAGACACAACAGACAGACTGACACAAAGACATAAACAGACTTTTAAATCCCGGTCTGACAATGGTGAGGGAATTC

Psi 1020 1040 1060 1080 1100
TTTGACCTTAGGTCAGTGGAAAGATGTGAGCGGATCGCTCACAAACAGTCCGTTAGTGTCAAGAAGAGACGTTGGGTTACCTTCTGCTCTG
AAACTGGAATCCAGTGACCTTTCTACAGCTCGCCTAGCGAGTGTGGTCAAGCATCTACAGTTCTTCTCTGCAACCCAATGGAAGACGAGAC

Psi 1.120 1.140 1.160 1.180
CAGAATGGCCAACCTTTAACGTGGATGGCCGCGAGACGGCACCTTTAACCGAGACCTCATCACCCAGGTTAAGATCAAGGCTTTTACCT
GTCTTACCGGTTGGAAATTCAGCCTACCGGCGCTCTGCCGTGGAAATGGCTCTGGAGTAGTGGTCCAATTCTAGTTCAGAAAAGTGA

Psi 1.200 1.220 1.240 1.260 1.280
GGCCCCGATGGACACCCAGACCAGGTCCTACATCGTGACCTGGGAAGCCTTGGCTTTTGACCCCCCTCCCTGGGTCAAGCCCTTTGTACA
CCGGGCGTACCTGTGGGTCTGGTCCAGGGATGTAGCACTGGACCTTCGGAACCGAAAACCTGGGGGAGGGACCCAGTTCGGGAACATGT

Psi 1.300 1.320 1.340 1.360 1.380
CCCTAAGCCTCCGCTCCTCTTCTCCATCCGCCCGTCTCTCCCTTGAACCTCCTCGTTCGACCCCGCCTCGATCCTCCCTTTATCCAG
GGGATTCGGAGCGGAGGAGAAGGAGGTAGCGGGGCGAGAGGGGGAACCTGGAGGAGCAAGCTGGGCGGAGCTAGGAGGAAATAGGTC

Psi 1.400 1.420 1.440 hU6 promoter 1.460
CCCTCACTCCTTCTAGGGCCCGGAATTAGATCGATCTCTCGACCTAGAGATATCGTTCGACCCACGAGGGCCTATTTCCATGATTCT
GGGAGTGAGGAAGAGATCCGCGGCCTTAATCTAGCTAGAGAGCTGGATCTCTATAGCACTGGGGGTGCTCCCGGATAAAGGGTACTAAGGA

hU6 For sequencing primer
hU6 promoter 1.500 1.520 1.540 1.560
TCATATTTGCATATACGATACAAGGCTGTTAGAGAGATAATTGGAATTAATTTGACTGTAAACACAAAGATATTAGTACAAAATACGTGAGC
AGTATAACGTATATGCTATGTTCCGACAATCTCTCTATTAACCTTAATTAACCTGACATTTGTGTTTCTATAATCATGTTTTATGCACTGC

hU6 promoter 1.580 1.600 1.620 1.640
TAGAAAGTAATAATTTCTGGGTAGTTTGCAGTTTTAAAATATGTTTTAAAATGGACTATCATATGCTTACCGTAACTTGAAGTATTTTCG
ATCTTTCATTATTAAGAACCACCAACGTCAAAATTTAATACAAAATTTACCTGATAGTATACGAATGGCATTGAACTTTCATAAAGC

hU6 promoter 1.680 BbsI overhang BbsI binding site 1.720 1.740 Lac Promoter
ATTTCTTGGCTTTATATATCTTGTGAAAGGACGAAACACCGGCTCTTCGCGGCCGATTAGGCACCCACAGGCTTTACACTTTATGCTTCCG
TAAAGAACCGAAATATATAGAACACCTTCTGCTTGTGCTCCAGAAAGCGCCGGGTAATCCGTGGGTCCGAAATGTGAAATACGAAGGC

Lac Promoter 1.760 1.780 1.800 1.820 1.840 Chloramphenicol resistance
GCTCGTATAATGTGGATTTGAGTTAGGATCCGTCGAGATTTT CAGGAGCTAAGGAAGCTAAAATGGAGAAAAAATCACTGGATATACC
CGAGCATATTACACACTAAAACCTCAATCCTAGGCAGCTCTAAAAGTCTCGATTCTTCGATTTTACCTCTTTTTTAGTGACCTATATGG

Chloramphenicol resistance 1.860 1.880 1.900 1.920
ACGTTGATATATCCCAATGGCATCGTAAAGAACATTTT GAGGCATTTTCAGTCAGTTGCTCAATGTACCTATAACAGACCGTTCAGCTGGA
TGGCAACTATATAGGGTTACCGTAGCATTTCTTGTA AAAACTCCGTA AAGTCAGTCAACGAGTTACATGGATATTGCTCTGGCAAGTCGACCT

Chloramphenicol resistance 1.960 1.980 2.000 2.020
TATTACGGCCTTTTTAAAGACCGTAAAGAAAAATAAGCACAAGTTTTATCCGGCCTTTATTCACATTTCTTGCCCGCTGATGAATGCTCATC
ATAATGCCGAAAAATTTCTGGCATTCTTTTTATTTCGTTTCAAATAGCGCGGAAATAAGTGTAAAGACGGGCGGACTACTTACGAGTAG

Chloramphenicol resistance 2.040 2.060 2.080 2.100
CGGAATTCGTATGGCAATGAAAGACGGTGAGCTGGTGATATGGGATAGTGTTCACCTTGTACACCGTTTTCCATGAGCAAACTGAAACG
GCCTTAAGGCATACCGTTACTTTCTGCCACTCGACCCTATACCTATCACAAGTGGGAACAATGTGGCAAAAGGTA CTGTTGACTTTGC

Chloramphenicol resistance

BbsI binding site

TTTTCATCGCTCTGGAGTGAATACCACGACGATTTCCGGCAGTTTCTACACATATATTCGCAAGATGTGGCGTGTACGGTGAAAACCTGGC
AAAAGTAGCGAGACCTCACTTATGGTGCTGCTAAAGGCCGTCAAAGATGTGTATATAAGCGTTCTACACCGCACAAATGCCACTTTTGACCG

Chloramphenicol resistance

BbsI binding site

CTATTTCCCTAAAGGGTTTTATTGAGAAATATGTTTTTCGTCTCAGCCAATCCCTGGGTGAGTTTCACCAGTTTTGATTTAAACGTGGCCAATA
GATAAAGGGATTTCCCAAATAACTCTTATACAAAAAGCAGAGTCGGTTAGGGACCCACTCAAAGTGGTCAAAAATAAATTTGCACCGGTTAT

Chloramphenicol resistance

BbsI binding site

TGGACAACCTCTTCGCCCCGTTTTCCACATGGGCAAATATTATACGCAAGGCGACAAGGTGCTGATGCCGCTGGCGATTCCAGTTTCATCAT
ACCTGTTGAAGAAGCGGGGGCAAAGTGGTACCCTTTATAATATGCGTTCGCTGTTCCACGACTACGGCGACCGCTAAGTCCAAGTAGTA

Chloramphenicol resistance

BbsI binding site

GCCGTTTGTGATGGCTTCCATGTCGGCAGAAATGCTTAATGAATACAACAGTACTGCGATGAGTGGCAGGGCGGGGGCGTAAACGCGTGGATC
CGGCAAACACTACCGAAGGTACAGCGCTTACGAATTACTTAATGTTGTCATGACGCTACTCACGTCGCGCCCGCATTTGCGCACCTAG

BbsI binding site

CGGCTTACTAAAAGCCAGATAACAGTATGCGTATTTGCGCGCTGATTTTTCGGGTATAAGAATATATACTGATATGTATACCCGAAGTATGT
GCCGAATGATTTTCGGTCTATTGTCATACGCATAAACGCGGACTAAAAACGCCATATCTTATATATGACTATACATATGGGCTTCATACA

BbsI binding site

CAAAAAGAGGTATGCTATGAAGCAGCGTATTACAGTGACAGTTGACAGCGACAGCTATCAGTTGCTCAAGGCATATATGATGTCAATATCTC
GTTTTCTCCATACGATACTTCGTCGCATAATGTCACGTGCAACTGTCGCTGTCGATAGTCAACGAGTTCGATATACTACAGTTATAGAG

BbsI binding site

CGGTCTGGTAAGCACAACCATGCAGAAATGAAGCCCGTCTGCGTGCCGAACGCTGGAAAGCGGAAAAATCAGGAAGGGATGGCTGAGGTGCG
GCCAGACCATTCGTGTTGGTACGTCTTACTTCGGGCAGCAGACGACGCGCTTTCGACCTTTTCGCCTTTTAGTCCTTCCCTACCGACTCCAGC

ccdB gene

BbsI binding site

CCCGGTTTATTGAAATGAACGGCTCTTTTGTGTCAGGAGAACAGGGGCTGGTGAATGCAGTTTAAAGTTTACACCTATAAAAGAGAGAGCCG
GGGCCAAATAACTTTACTTGCAGAAAACGACTGCTCTTGTCCCGACCACTTTACGTCAAATTCAAATGTGGATATTTTCTCTCTCGGG

ccdB gene

BbsI binding site

TTATCGTCTGTTTGTGGATGTACAGAGTGATATTATTGACACGCCCGGGCGACGGATGGTGTATCCCCGTCAGTGCACGCTGCTGTTCAG
AATAGCAGACAAAACCTACATGTCTCACTATAATAACTGTGCGGGCCCGCTGCCTACCACTAGGGGGACCGGTACGTGCAGACGACAGTC

ccdB gene

BbsI binding site

ATAAAGTCTCCCGTGAACCTTACCCTGGTGCATATCGGGGATGAAAGCTGGCGCATGATGACCACCGATATGGCCAGTGTCCCGGCTCC
TATTTACAGAGGCACTTGAATGGGCCACACGATAGCCCTACTTTCGACCGCTACTACTGGTGGCTATACCGGTACACGCGCCAGAGG

ccdB gene

BbsI binding site

3,060 3,080 3,100 3,120

GTTATCGGGGAAGAAGTGGCTGATCTCAGCCACCGCGAAAATGACATCAAAAACGCCATTAACCTGATGTTCTGGGGAATATAAATGTCAGG
CAATAGCCCTTCTTACCAGACTAGAGTCGGTGGCGCTTTACTGTAGTTTTGCGGTAATTGGACTACAAGACCCCTTATATTTACAGTCC

BbsI binding site 3,140

BbsI NA scaffold 3,180 3,200 3,220

3,160

CTCCCTTATACACAGCCAGTCTGCAGGTGCGAAGACCTGTTTTAGAGCTAGAAATAGCAAGTTAAAATAAGGCTAGTCCGTTATCAACTTGAA
GAGGGAATATGTGTGGTCCAGCTCCAGCTTCTGGACAAAATCTCGATCTTTATCGTTCAATTTTATTCCGATCAGGCAATAGTTGAACCT

BbsI overhang

sgRNA scaffold 3,240

3,260 3,280 3,300

AAAGTGGCACCGAGTCGGTGTCTTTTTGTTTTAGAGCTAGAAATAGCAAGTTAAAATAAGGCTAGTCCGTTTTAGGCGGTGGCCAACTTCT
TTTACCCTGGCTCAGCCACGAAAAACAAAATCTCGATCTTTATCGTTCAATTTTATTCCGATCAGGCAAAAATCGCGCACGGTTAAGA

PGK promoter 3,320 3,340 3,360 3,380 3,400

GCAGACAAATGGCTCCTCGAGAATTGCGGAATCGATGTTAACCGGTAATTCTACCGGTAGGGGAGGCGCTTTTCCCAAGGCAGTCTGGAGC
CGTCTGTTTACCAGGAGCTCTTAAGCGCTTAGCTACAATTGCGCATTAAGATGGCCATCCCTCCGCGAAAAGGGTTCCGTCAGACCTCG

PGK promoter 3,420 3,440 3,460 3,480

ATGCGCTTTAGCAGCCCCGCTGGGCACTTGGCGCTACACAAGTGGCCTCTGGCCTCGCACACATTCACATCCACCGGTAGGCGCCAACCG
TAGCGAAATCGTCGGGGGACCCGTGAACCGGATGTGTTACCGGAGACGGAGCGTGTGAAGGTGTAAGTGGCCATCCGCGGTTG6CC

PGK promoter 3,520 3,540 3,560 3,580

CTCCGTTCTTTGGTGGCCCCCTTCGCGCCACCTTCTACTCCTCCCTAGTCAGGAAGTTCCCCCGCCCCGAGCTCGCGTGTGCAGGAGC
GAGGCAAGAAACCACGGGGAAGCGCGGTGGAAGATGAGGAGGGATCAGTCTTCAAGGGGGGCGGGCGTGCAGCGCAGCAGTCTCTGC

PGK promoter 3,600 3,620 3,640 3,660 3,680

TGACAAATGGAAGTAGCACGTCTCACTAGTCTCGTGCAGATGGACAGCACCGCTGAGCAATGGAAGCGGGTAGGCCCTTTGGGGCAGCGGCCA
ACTGTTTACCTTCATCGTGCAGAGTGTATCAGAGCACGTCTACCTGTGTTGGCGACTCGTTACCTTCGCCATCCGGAAACCCCGTCCGCGGT

PGK promoter 3,700 3,720 3,740 3,760

ATAGCAGCTTTGCTCCTTCGCTTTCTGGGCTCAGAGGCTGGGAAGGGGTGGTCCGGGGGCGGCTCAGGGGCGGGCTCAGGGGCGGGCGG
TATCGTCGAAACGAGGAAGCGAAAGACCCGAGTCTCCGACCTTCCCACCCAGGCCCGCCGAGTCCCCGCCGAGTCCCCGCCCGGCT

PGK promoter 3,800 3,820 3,840 3,860

GCGCCGAAGGCTCCTCCGAGGCCCGGCATTTGACAGCTTCAAAGCGCACGCTGCGCGCTGTTCTCCTTCTCATCTCCGGGCGCTT
CGCGGGCTTCCAGGAGGCTCCGGGCGTAAGACGTGCGAAGTTTTGCGGTGCAGACGGCGGACAAGAGGAGAAGGAGTAGAGGCCGGAA

PGK promoter 3,880

NheI

Puromycin resistance 3,920 3,940

TCGACCTGCAGCCCAAGCTAGCTTACCATGACCGAGTACAAGCCACGGTGGCGCTGCCACCCGCGACGACGTCCCCAGGGCGGTAGGCAC
AGCTGGACGTCCGGTTCGATCGAATGGTACTGGCTCATGTTCCGGTGCCACGCGGAGCGGTGGCGCTGCTGCAGGGGTCCCGGCATGCGTG

Puromycin resistance 3,980 4,000 4,020 4,040

CCTCGCGCGCGGTTGCGCGACTACCCGCCACGCGCCACACCGTGCATCCGACCGCCACATCGAGCGGTCACCGAGCTGCAAGAATCTT
GGAGCGCGCGCGCAAGCGGCTGATGGGGCGGTGCGCGGTGTGGCAGCTAGCCCTGGCGGTGTAGCTCGCCAGTGCGCTCGAGCTTCTGAGA

Puromycin resistance 4,080 4,100 4,120 4,140

TCCTCACGCGCGTCCGGCTCGACATCGGCAAGGTGTGGTTCGCGGACGACGGCGCGCGGTGGCGGTCTGGACCACCGCGGAGAGCGTGC
AGGAGTGCAGCGACCCGAGCTGTAGCCGTTCCACACCCAGCGCTGCTGCCGCGGCGCCACCGCCAGACCTGGTGGCGCTCTCGCAGCTT

Puromycin resistance 4.160 4.180 4.200 4.220
GCGGGGGCGGTGTTTCGCCGAGATCGGCCCGGCATGGCCGAGTTGAGCGGTTCCCGCTGGCCGCGCAGCAACAGATGGAAGGCCTCCGGC
CGCCCCGCCACAAGCGGCTCTAGCCGGGCGGTACCGGCTCAACTCGCCAAGGGCCGACCGGCGGTGCTGTCTACCTCCGGAGGACCG

Puromycin resistance 4.260 4.280 4.300 4.320
GCCGCACGGCCCAAGGAGCCCGGTGTTTCTGGCCACCGTCGGCGTCTCGCCGACCACCAGGGCAAGGGTCTGGGCAGCGCCGTGCTGC
CGGCGTGGCCGGTTCTCGGGCGCACCAAGGACCGGTGGCAGCCGAGAGCGGGTGGTGGTCCCGTCCCAGACCCGTGCGGGCAGCAGC

Puromycin resistance 4.340 4.360 4.380 4.400
TCCCCGAGTGGAGGCGGCCGAGCGCGCCGGGTGCCGCCTTCTGGAGACTCCGCGCCCCGCAACCTCCCCTTCTACGAGCGGCTCGGC
AGGGGCTCACCTCCGCGGCTCGCGGGCCACGGGCGGAAGGACCTCTGGAGGCGGGGCGTTGGAGGGGAAGATGCTCGCCGAGCCG

Puromycin resistance 4.440 4.460 4.480 **T2A peptide** 4.500
TTCACCGTCACCGCGCAGCTCGAGGTGCCGAAGGACCGCGCACCTGGTGCATGACCCGCAAGCCGGTGCAGGGGCAGAGGAAGTCTGCT
AAGTGGCAGTGGCGGCTGCAGCTCCACGGGCTTCTGGCGCGTGGACCAGTACTGGGCGTTCGGGCCACGGCTCCCGTCTCTTACAGCGA

T2A peptide 4.520 4.540 **BFP** 4.560 4.580 4.600
AACATGCGGTGACGTGGAGGAGAATCCCGGCCCTGCTAGCATGGTGAGCAAGGGCGAGGAGCTGTTACCGGGGTGGTGCCATCCTGGTGC
TTGTACGCCACTGCACCTCTTTAGGGCCGGGACGATCGTACCACCTCGTTCGCCGCTCTCGACAAGTGGCCCCACCACGGGTAGGACCAGC

BFP 4.620 4.640 4.660 4.680
AGCTGGACGGCGACGTAACCGCCACAAGTTCAGCGTGAGGGGCGAGGGCGAGGGCGATGCCACCAACGGCAAGCTGACCTGAAGTTCATC
TCGACCTGCCGCTGCATTTGCCGGTGTCAAGTGCACCTCCCGCTCCCGCTCCCGTACGGTGGTTGCCGTTGACTGGGACTTCAAGTAG

BFP 4.700 4.720 4.740 4.760 4.780
TGCACCACGGCAAGCTGCCCGTGCCCTGGCCACCCTCGTGACCACCTGAGCCACGGCGTGCAGTGTTCGCCCGCTACCCCGACCACAT
ACGTGGTGGCCGTTGACGGGCACGGGACCGGGTGGGAGCACTGGTGGGACTCGGTGCCGCACGTACGAAGCGGGCGATGGGGCTGGTGT

BFP 4.800 4.820 4.840 4.860
GAAGCAGCACGACTTCTTCAAGTCCGCCATGCCGAAGGCTACGTCCAGGAGCGCACCATCTTCTTCAAGGACGACGGCACCTACAAGACCC
CTTCGTCGTGCTGAAGAAGTTCAGGCGGTACGGGCTCCGATGCAGGCTCTCGCGTGGTAGAAGAAGTTCCTGCTGCCGTGGATGTTCTGGG

BFP 4.880 4.900 4.920 4.940 4.960
CGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACCGCATCGAGCTGAAGGGCGTCACTTCAAGGAGGACGGCAACATCCTGGGGCAC
CGCGGCTCCACTTCAAGCTCCCGCTGTGGGACCACCTGGCGTAGCTCGACTCCCGCAGCTGAAGTTCCTCCTGCCGTTGTAGGACCCCGT

BFP 4.980 5.000 5.020 5.040 5.060
AAGCTGGAGTACAACCTTCAACAGCCACAACATCTATATCATGGCCGTCGAAGCAGAAGAACGGCATCAAGGTGAAGTTCGAAGTCCGCCACAA
TTGACCTCATGTTGAAGTGTGCGGTTGTAGATATAGTACGGCAGTTCGTTCTTCCCGTAGTTCACCTTGAAGTTCAGGCGGTGTT

BFP 5.080 5.100 5.120 5.140
CGTGGAGGACGGCAGCGTGCAGCTCGCCGACCACTACCAGCAGAACACCCCATCGGCGACGGCCCGTGTGCTGCTGCCGACAGCCACTACC
GCACCTCCTGCCGTCGCACGTCGAGCGGCTGGTGTGATGGTTCGTTCTGTTGGGGTAGCCGCTGCCGGGGCACGACGACGGGCTGTCGGTATGG

BFP 5.160 5.180 5.200 5.220 5.240
TGAGCACCCAGTCCGTGCTGAGCAAAGACCCCAACGAGAAGCGCGATCACATGGTCTGCTGGAGTTCGCCACCGCCCGCGGGATCACTCTC
ACTCGTGGGTCAAGCAGCACTCGTTTCTGGGGTGTCTTTCGCGCTAGTGTACCAGGACGACCTCAAGGCGTGGCGGGCCCTAGTGAGAG

BFP 5.260 → MluI(1) 5.280 5.300 3'LTR 5.310
GGCATGGACGAGCTGTACAAGTGAACGCGTCGATAAAAATAAAAGATTTTATTTAGTCTCCAGAAAAAGGGGGAATGAAAGACCCACCTGT
CCGTACCTGCTCGACATGTTCACTTGCAGCTATTTTATTTTCTAAAATAAATCAGAGGCTTTTTTCCCCCTTACTTTCTGGGTGGACA

3'LTR 5.340 5.360 5.380 5.400 5.420
AGGTTTGGCAAGCTAGAGAACCATCAGATGTTTCCAGGGTGCCCAAGGACCTGAAATGACCCGTGTCCTTATTTGAACTAACCAATCAGTT
TCCAAACCGTTTCGATCTCTTGGTAGTCTACAAAGGTCACAGGGGTCTCTGGACTTACTGGGACACGGAATAAAGTATTGATTGGTTAGTCAA

3'LTR 5.440 5.460 5.480 5.500 5.520
CGCTTCTCGCTTCTGTTTCGCGCGCTTCTGCTCCCCGAGCTCAATAAAAGAGCCACAAACCCTCACTCGGCGCGCCAGTCTCCGATAGACT
CGAAGAGCGAAGACAAGCGCGGAAGACGAGGGGCTCGAGTTATTTCTCGGGTGTGGGGAGTGAGCCGCGGGTTCAGGAGGCTATCTGA

3'LTR 5.540 5.560 5.580 5.600
GCGTCGCCGGGTACCCGTGTATCCAATAAACCTCTTGCAGTTGCATCCGACTTGTGGTCTCGCTGTTTCTTGGGAGGGTCTCCTCTGAGT
CGCAGCGGGCCATGGGCACATAGGTTATTTGGGAGAAGCTCAACGTAGGCTGAACACCAGAGCGACAAGGAACCCTCCAGAGGAGACTCA

3'LTR 5.620 → 5.640 5.660 5.680 5.700
GATTGACTACCCGTCAGCGGGGCTTTTCA TGGGTAACAGTTTCTTGAAGTTGGAGAACAACATTTCTGAGGGTAGGAGTCAATATTAAGTA
CTAACTGATGGGCAGTCGCCCCAGAAAGTACCATTGTCAAAGAACTTCAACCTCTTGTGTAAGACTCCCATCCTCAGCTTATAATTCAT

5.720 5.740 5.760 5.780
ATCCTGACTCAATTAGCCACTGTTTTGAATCCACATACTCCAATACTCCTGAAATAGTTTATTATGGACAGCGCAGAAGAGCTGGGGAGAA
TAGGACTGAGTTAATCGGTGACAAAACCTTAGGTGTATGAGGTTATGAGGACTTTATCAAGTAATACCTGTGCGTCTTCTCGACCCCTTAA

5.800 5.820 5.840 5.860 5.880
TAATTCGTAATCATGGTCATAGCTGTTTCTGTGTGAAATGTTATCCGCTCACAATTCACACAACATACGAGCCGGAAGCATAAAGTGTA
ATTAAGCATTAGTACCAGTATCGACAAAGGACACACTTAAACAATAGGCGAGTGTTAAGGTGTGTTGTATGCTCGGCCTTCGTATTTACAT

5.900 5.920 5.940 5.960 5.980
AAGCCTGGGGTGCCTAATGAGTGAGCTAACTCACATTAATTGCGTTGCGCTCACTGCCGCTTCCAGTCGGGAAACCTGTCTGCCAGCTG
TTCGGACCCACGGATTACTCACTCGATTGAGTGTAATTAACGCAACGCGAGTGACGGGGCAAAGGTCAGCCCTTTGGACAGCACGGTCGAC

6.000 6.020 6.040 6.060
CATTAATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTTCGCTATTGGGCGCTCTTCCGCTTCCCTCGCTCACTGACTCGCTGCGCTCGGTCTG
GTAATTAAGTACCGGTTGCGCGCCCTCTCCGCCAAACGCATAACCCGCGAGAAGGCGAAGGAGCGAGTGACTGAGCGACGCGAGCCAGCA

6.080 6.100 6.120 6.140 6.160
TCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGCGGTAAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAAGAACATGTGAGCAA
AGCCGACGCCGCTCGCCATAGTCGAGTGAGTTTCCGCCATTATGCCAATAGGTGTCTTAGTCCCTATTGCGTCTTTCTTTACACTCGTT

6.180 6.200 6.220 6.240
AAGCCAGCAAAAGGCCAGGAACCGTAAAAAGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAAATCGA
TTCCGGTCGTTTTCCGGTCTTGGCATTTCGCGCAACGACCGCAAAAAGGTATCCGAGGCGGGGGACTGCTCGTAGTGTTTTTAGCT

6.260 6.280 6.300 6.320 6.340
CGCTCAAGTCAGAGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGGCTCTCCTGTTCCGAC
CGGAGTTCAGTCTCACCCGCTTTGGGCTGTCTGATATTTCTATGGTCCGCAAAAGGGGACCTTCGAGGAGCACCGGAGAGGACAAGGCTG

6.360 6.380 6.400 6.420 6.440
CCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGAAGCGTGGCGCTTTTCATAGCTCAGCTGTAGGTATCTCAGTTCGGTGT
GGACGGCGAATGGCCTATGGACAGGCGAAAGAGGGAAGCCCTTCGCACCGCGAAAGAGTATCGAGTGGGACATCCATAGAGTCAAGCCACA

6.460 6.480 6.500 6.520
AGGTCGTTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCGCTTCAGCCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAAC
TCCAGCAAGCGAGGTTCCAGCCGACACACGTGCTTGGGGGGCAAGTCGGCTGGCGACGCGGAATAGGCCATTGATAGCAGAACTCAGGTTG

6.540 6.560 6.580 6.600 6.620
CCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGTACAGAGTCTTGAA
GGCCATTCTGTGCTGAATAGCGGTGACCGTCGTCGGTGACCATTGCTCTAATCGTCTCGCTCCATACATCCGCCACGATGCTCAAGAACTT

6.640 6.660 6.680 6.700
GTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCT
CACCACCGGATTGATGCCGATGTGATCTTCTGTGCATAAACCATAGACCGGAGACGACTTCGGTCAATGGAAGCCTTTTTCTCAACCATCGA

6.720 6.740 6.760 6.780 6.800
CTTGATCCGGCAAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTTGTTTGAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGT
GAACTAGGCCGTTTTGTTTTGGTGGCGACCATCGCCACCAAAAAACAAACGTTTCGTCGTCTAATGCGCGCTTTTTTTCTCAGAGTTCTTCTA

6.820 6.840 6.860 6.880 6.900
CCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAAACGAAAACCTCACGTTAAGGGATTTTGGTTCATGAGATTATCAAAAAGGATCTTAC
GGAAACTAGAAAAGATGCCCCAGACTGCGAGTCACCTTGCTTTGAGTGAATTCCTAAAACAGTACTCTAATAGTTTTCTTAGAAGT

6.920 6.940 6.960 Ampicillin resistance (bla)
CTAGATCCTTTTAAATTAATAAATGAAGTTTTAAATCAATCTAAAGTATATATGAGTAACTTGGTCTGACAGTTACCAATGCTTAATCAGTG
GATCTAGGAAAATTAATTTTTACTTCAAAATTTAGTTAGATTTTCATATATACTCATTGGAACCAGACTGTCAATGGTTACGAATTAGTAC

Ampicillin resistance (bla) 7.020 7.040 7.060 7.080
AGGCACCTATCTCAGCGATCTGTCTATTTTCGTTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCA
TCCGTGGATAGAGTCGCTAGACAGATAAAGCAAGTAGGTATCAACGGACTGAGGGGCAGCACATCTATTGATGCTATGCCCTCCCGAATGGT

Ampicillin resistance (bla) 7.100 7.120 7.140 7.160
TCTGGCCCAAGTCTGCAATGATACCGCGAGACCCACGCTCACCAGGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAGCG
AGACCGGGGTACGACGTTACTATGGCGCTCTGGGTGCGAGTGGCCGAGGTCTAAATAGTCGTTATTTGGTGGTCCGGCCTTCCCGGCTCGC

Ampicillin resistance (bla) 7.200 7.220 7.240 7.260
CAGAAGTGGTCCGCAACTTATCCGCTCCATCCAGTCTATTAATGTTGCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGC
GTCTTACCAGGACGTTGAATAGGCGGAGGTAGGTCAGATAATTAACAACGGCCCTTCGATCTCATTTCATCAAGCGGTCAATTATCAAACG

Ampicillin resistance (bla) 7.300 7.320 7.340 7.360
GCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTACGCTCGTCTGTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCGA
CGTTGCAACAACGGTAACGATGTCCGTAGCACACAGTGGCAGCAGCAACCATACCGAAGTAAGTCGAGGCCAAGGGTTGCTAGTTCGGT

Ampicillin resistance (bla) 7.380 7.400 7.420 7.440
GTTACATGATCCCCATGTTGTGCAAAAAGCGGTTAGCTCCTTCGGTCTCCGATCGTTGTGCAAGTAAGTTGGCCGAGTGTATCACT
CAATGTACTAGGGGTACAACACGTTTTTTTCGCCAATCGAGGAAGCCAGGAGGCTAGCAACAGTCTTTCATTCAACCGCGTCACAATAGTGA

Ampicillin resistance (bla) 7.480 7.500 7.520 7.540

CATGGTTATGGCAGCACTGCATAATTCTCTTACTGTTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCAATCT
GTACCAATACCGTCGTGACGTATTAAGAGAATGACAGTACGGTAGGCATTCTACGAAAAGACACTGACCACCTCATGAGTTGGTTCAGTAAGA

Ampicillin resistance (bla) 7.560 7.580 7.600 7.620

GAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATC
CTCTTATCACATACGCCGCTGGCTCAACGAGAACGGGCGCAGTTATGCCCTATTATGGCGGGTGTATCGTCTTGAAATTTTACAGAGTAG

Ampicillin resistance (bla) 7.660 7.680 7.700 7.720

ATTGAAAACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCCTGTTGAGATCCAGTTTCGATGTAACCCACTCGTGCACCCAACCTGATC
TAACCTTTTGCAAGAAGCCCGCTTTTGAGAGTTCTAGAATGGCGACAACCTTAGGTCAAGCTACATTGGGTGAGCACGTGGGTTGACTAG

Ampicillin resistance (bla) 7.760 7.780 7.800 7.820

TTCAGCATCTTTTACTTTACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAGGGAATAAGGGCGACACGGAAAT
AAGTCGTAGAAAATGAAAAGTGGTCGCAAAAGACCCACTCGTTTTTGTCTTCCGTTTTACGGCGTTTTTCCCTTATTCGCCGTGTGCCTTTA

Ampicillin resistance (bla) 7.840 7.860 7.880 7.900

GTTGAATACTCATACTCTTCTTTTCAATATTATTGAAGCATTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAG
CAACTTATGAGTATGAGAAGGAAAAAGTTATAATAACTTCGTAAATAGTCCAATAACAGAGTACTCGCCTATGTATAAACTTACATAAATC

7.920 7.940 7.960 7.980 8.000

AAAAATAAACAAATAGGGGTTCCGCGCACATTTCCCGAAAAGTGCCACCTGACGTCTAAGAAACCATTATTATCATGACATTAACCTATAA
TTTTTATTTGTTTATCCCAAGGCGGTGTAAAGGGCTTTTACGGTGGACTGCAGATTCTTTGGTAATAATAGTACTGTAATTGGATATT

8.020 8.040 8.060 8.080

AAATAGGCGTATCACGAGGCCCTTTTCGTCTCGCGCGTTTTCGGTGATGACGGTGAAAACCTCTGACACATGCAGCTCCCGGAGACGGTCACAG
TTTATCCGCATAGTGTCCGGGAAAGCAGAGCGCGCAAAGCCACTACTGCCACTTTTGGAGACTGTGTACGTGAGGGCCTCTGCCAGTGTCT

8.100 8.120 8.140 8.160 8.180

CTTGTCTGTAAGCGGATGCCGGGAGCAGACAAGCCCGTCAAGGGCGCGTACGCGGTGTTGGCGGGTGTGCGGGCTGGCTTAACCTATGCCGCA
GAACAGACATTCGCCCTACGGCCCTCGTCTGTTTCGGGCAGTCCCGCGCAGTCCGCCACAACCGCCACAGCCCGACCGAATTGATACGCCGT

8.200 8.220 8.240 8.260 8.280

TCAGAGCAGATTGACTGAGAGTGCACCATATGCGGTGTGAAATACCGCACAGATGCGTAAGGAGAAAAATACCGCATCAGGCGCCATTCCGCC
AGTCTCGTCTAACATGACTCTCACGTGGTATACGCCACACTTTATGGCGTGTCTACGCATTCTCTTTTATGGCGTAGTCCGGGTAAGCGG

8.300 8.320 8.340 8.360

ATTCAGGCTGCGCAACTGTTGGGAAGGCGATCGGTGCGGGCCTCTTCGCTATTACGCCAGCTGGCGAAAAGGGGATGTGCTGCAAGGCGAT
TAAGTCCGACGCGTTGACAACCCTTCCCGCTAGCCACGCCCGGAGAAGCGATAATGCGGTGCGACCGCTTTCCCTTACACGACGTTCCGCTA

8.380 8.400 8.420 8.440 8.460

TAAGTTGGGTAACGCCAGGGTTTTCCAGTCAAGCAGTTGTAAAACGACGGCGCAAGGAATGGTGCATGCAAGGAGATGGCGCCCAACAGTC
ATTCAACCCATTGCGGTCCCAAAGGGTCAGTGTGCAACATTTTGTCTGCCGCTTCTTACCACGTACGTTCTCTACCGCGGGTTGTGCA

8.480 8.500 8.520 8.540

CCCCGGCCACGGGGCTGCCACCATACCCACGCCGAAACAAGCGCTCATGAGCCGAAAGTGGCGAGCCGATCTTCCCATCGGTGATGTGG
GGGGCCGTTGCCCGGACGGTGGTATGGGTGCGGCTTTGTTTCGCGAGTACTCGGGCTTACCGCTCGGGCTAGAAGGGGTAGCCACTACAGC

8.560 8.580 8.600 8.620 8.640
GCGATATAGGCGCCAGCAACCGCACCTGTGGCGCCGGTGATGCCGGCCACGATGCGTCCGGCGTAGAGGCGATTAGTCCAATTTGTTAAAGA
CGCTATATCCGCGGTCGTTGGCGTGACACCGCGGCCACTACGGCCGGTGCTACGCAGGCCGCATCTCCGCTAATCAGGTTAAACAATTTCT

8.660 8.680 8.700 8.720 8.740
CAGGATATCAGTGGTCCAGGCTCTAGTTTTGACTCAACAATATCACCAGCTGAAGCCTATAGAGTACGAGCCATAGATAAAATAAAAGATT
GTCCTATAGTCACCAGGTCGAGATCAAACTGAGTTGTTATAGTGGTCGACTTCGGATATCTCATGCTCGGTATCTATTTTATTTCTAAA

8.760
TATTTAGTCTCCAGAAAAAGGGGGAA
ATAAATCAGAGGCTTTTTCCCCCTT >>