

pJG4-5 (pB42AD)

GAL1 promoter

1 CCCATTATC TTAGCCTAAA AAAACCTTCT CTTTGGAACT TTCAGTAATA
GGGGTAATAG AATCGGATTT TTTTGGAAGA GAAACCTTGA AAGTCATTAT

GAL1 promoter

51 CGCTTAACTG CTCATTGCTA TATTGAAGTA CGGATTAGAA GCCGCCGAGC
GCGAATTGAC GAGTAACGAT ATAACTTCAT GCCTAATCCT CGGCGGCTCG

GAL1 promoter

101 GGGTGACAGC CCTCCGAAGG AAGACTCTCC TCCGTGCGTC CTCGTCTTCA
CCCCTGTCG GGAGGCTTCC TTCTGAGAGG AGGCACGCAG GAGCAGAAGT

GAL1 promoter

AgeI

151 CCGGTCGCGT TCCTGAAACG CAGATGTGCC TCGCGCCGCA CTGCTCCGAA
GGCCAGCGCA AGGACTTTGC GTCTACACGG AGCGCGGCGT GACGAGGCTT

GAL1 promoter

201 CAATAAAGAT TCTACAATAC TAGCTTTTAT GGTTATGAAG AGGAAAAATT
GTTATTTCTA AGATGTTATG ATCGAAAATA CCAATACTTC TCCTTTTTAA

GAL1 promoter

251 GGCAGTAACC TGGCCCCACA AACCTTCAAA TGAACGAATC AAATTAACAA
CCGTCATTGG ACCGGGGTGT TTGGAAGTTT ACTTGCTTAG TTTAATTGTT

GAL1 promoter

301 CCATAGGATG ATAATGCGAT TAGTTTTTTA GCCTTATTTTC TGGGGTAATT
GGTATCCTAC TATTACGCTA ATCAAAAAAT CGGAATAAAG ACCCCATTAA

GAL1 promoter

351 AATCAGCGAA GCGATGATTT TTGATCTATT AACAGATATA TAAATGCAAA
TTAGTCGCTT CGCTACTAAA AACTAGATAA TTGTCTATAT ATTTACGTTT

GAL1 promoter

401 AACTGCATAA CCACTTTAAC TAATACTTTC AACATTTTTCG GTTTGTATTA
TTGACGTATT GGTGAAATTG ATTATGAAAG TTGTAAAAGC CAAACATAAT

GAL1 promoter

451 CTTCTTATTC AAATGTAATA AAAGTATCAA CAAAAAATTG TTAATATACC
GAAGAATAAG TTTACATTAT TTTCATAGTT GTTTTTTAAAC AATTATATGG

GAL1 promoter

NLS

HindIII

+3

501 TCTATACTTT AACGTCAAGG AGGAATTAAG CTTATGGGTG CTCCTCCAAA
AGATATGAAA TTGCAGTTCC TCCTTAATTC GAATACCCAC GAGGAGGTTT

M G A P P K .

pJG4-5 (pB42AD)

NLS

B42AD

+3 • K K K R K V A G I N K D I E E C N A •

551 AAAGAAGAGA AAGGTAGCTG GTATCAATAA AGATATCGAG GAGTGCAATG
TTTCTTCTCT TTCCATCGAC CATAGTTATT TCTATAGCTC CTCACGTTAC

B42AD

+3 • A I I E Q F I D Y L R T G Q E M P

601 CCATCATTGA GCAGTTTATC GACTACCTGC GCACCGGACA GGAGATGCCG
GGTAGTAACT CGTCAAATAG CTGATGGACG CGTGGCCTGT CCTCTACGGC

B42AD

+3 M E M A D Q A I N V V P G M T P K •

651 ATGGAAATGG CGGATCAGGC GATTAACGTG GTGCCGGGCA TGACGCCGAA
TACCTTTACC GCCTAGTCCG CTAATTGCAC CACGGCCCGT ACTGCGGCTT

B42AD

+3 • K T I L H A G P P I Q P D W L K S N •

701 AACCATTTCTT CACGCCGGGC CGCCGATCCA GCCTGACTGG CTGAAATCGA
TTGGTAAGAA GTGCGGCCCG GCGGCTAGGT CGGACTGACC GACTTTAGCT

B42AD

+3 • N G F H E I E A D V N D T S L L L

751 ATGGTTTTCA TGAAATTGAA GCGGATGTTA ACGATAACCAG CCTCTTGCTG
TACCAAAGT ACTTTAACTT CGCCTACAAT TGCTATGGTC GGAGAACGAC

HA tag

B42AD

EcoRI

+3 S G D A S Y P Y D V P D Y A S

801 AGTGGAGATG CCTCCTACCC TTATGATGTG CCAGATTATG CCTCTCCCGA
TCACCTCTAC GGAGGATGGG AATACTACAC GGTCTAATAC GGAGAGGGCT

EcoRI

HindIII

ADH Terminator

XhoI

851 ATTCGGCCGA CTCGAGAAGC TTTGGACTTC TTCGCCAGAG GTTTGGTCAA
TAAGCCGGCT GAGCTCTTCG AAACCTGAAG AAGCGGTCTC CAAACCAGTT

ADH Terminator

901 GTCTCCAATC AAGGTTGTCG GCTTGTCTAC CTTGCCAGAA ATTTACGAAA
CAGAGGTTAG TTCCAACAGC CGAACAGATG GAACGGTCTT TAAATGCTTT

ADH Terminator

951 AGATGGAAAA GGGTCAAATC GTTGGTAGAT ACGTTGTTGA CACTTCTAAA
TCTACCTTTT CCCAGTTTAG CAACCATCTA TGCAACAAC TGAAGATTT

ADH Terminator

1001 TAAGCGAATT TCTTATGATT TATGATTTTT ATTATTAAAT AAGTTATAAA
ATTCGCTTAA AGAATACTAA AACTAAAAA TAATAATTTA TTCAATATTT

pJG4-5 (pB42AD)

ADH Terminator

1051 AAAAATAAGT GTATACAAAT TTTAAAGTGA CTCTTAGGTT TTAAAACGAA
TTTTTATTCA CATATGTTTA AAATTTCACT GAGAATCCAA AATTTTGCTT

ADH Terminator

1101 AATTCTTGTT CTTGAGTAAC TCTTTCCTGT AGGTCAGGTT GCTTTCTCAG
TTAAGAACAA GAACTCATTG AGAAAGGACA TCCAGTCCAA CGAAAGAGTC

ADH Terminator

1151 GTATAGCATG AGGTCGCTCT TATTGACCAC ACCTCTACCG GCATGCCGAG
CATATCGTAC TCCAGCGAGA ATAACTGGTG TGGAGATGGC CGTACGGCTC

ADH Terminator

1201 CAAATGCCTG CAAATCGCTC CCCATTTTAC CCAATTGTAG ATATGCTAAC
GTTTACGGAC GTTTAGCGAG GGGTAAAGTG GGTTAACATC TATACGATTG

ADH Terminator

1251 TCCAGCAATG AGTTGATGAA TCTCGGTGTG TATTTTATGT CCTCAGAGGA
AGGTCGTTAC TCAACTACTT AGAGCCACAC ATAAAATACA GGAGTCTCCT

ADH Terminator

BamHI

NotI

1301 CAACACCTGT TGTAATCGTT CTTCCACACG GATCCTCTAG AGTCGACTAG
GTTGTGGACA ACATTAGCAA GAAGGTGTGC CTAGGAGATC TCAGCTGATC

NotI

1351 CGGCCGCTTC GACCTGCAGC AATTCTGAAC CAGTCCTAAA ACGAGTAAAT
GCCGGCGAAG CTGGACGTCG TTAAGACTTG GTCAGGATTT TGCTCATTTA

1401 AGGACCGGCA ATTCTTCAAG CAATAAACAG GAATACCAAT TATTAAAAGA
TCCTGGCCGT TAAGAAGTTC GTTATTTGTC CTTATGGTTA ATAATTTTCT

2 μ m Ori

HindIII

1451 TAACTTAGTC AGATCGTACA ATAAAGCTTT GAAGAAAAT GCGCCTTATT
ATTGAATCAG TCTAGCATGT TATTTTCGAAA CTTCTTTTTA CGCGGAATAA

2 μ m Ori

1501 CAATCTTTGC TATAAAAAT GCCCAAAT CTCACATTGG AAGACATTTG
GTTAGAAACG ATATTTTTTA CCGGGTTTTA GAGTGTAACC TTCTGTAAAC

2 μ m Ori

1551 ATGACCTCAT TTCTTTCAAT GAAGGGCCTA ACGGAGTTGA CTAATGTTGT
TACTGGAGTA AAGAAAGTTA CTTCCCGGAT TGCTCAACT GATTACAACA

2 μ m Ori

1601 GGGAAATTGG AGCGATAAGC GTGCTTCTGC CGTGGCCAGG ACAACGTATA
CCCTTTAACC TCGCTATTGC CACGAAGACG GCACCGGTCC TGTTGCATAT

2 μ m Ori

1651 CTCATCAGAT AACAGCAATA CCTGATCACT ACTTCGCACT AGTTTCTCGG
GAGTAGTCTA TTGTCGTTAT GGACTAGTGA TGAAGCGTGA TCAAAGAGCC

pJG4-5 (pB42AD)

2 μ m Ori

1701 TACTATGCAT ATGATCCAAT ATCAAAGGAA ATGATAGCAT TGAAGGATGA
 ATGATACGTA TACTAGGTTA TAGTTTCCTT TACTATCGTA ACTTCCTACT

2 μ m Ori

1751 GACTAATCCA ATTGAGGAGT GGCAGCATAT AGAACAGCTA AAGGGTAGTG
 CTGATTAGGT TAACTCCTCA CCGTCGTATA TCTTGTCGAT TTCCCATCAC

2 μ m Ori

1801 CTGAAGGAAG CATACGATAC CCCGCATGGA ATGGGATAAT ATCACAGGAG
 GACTTCCTTC GTATGCTATG GGGCGTACCT TACCCTATTA TAGTGTCTTC

2 μ m Ori

1851 GTACTAGACT ACCTTTCATC CTACATAAAT AGACGCATAT AAGTACGCAT
 CATGATCTGA TGGAAAGTAG GATGTATTTA TCTGCGTATA TTCATGCGTA

2 μ m Ori

1901 TTAAGCATAA ACACGCACTA TGCCGTTCTT CTCATGTATA TATATATACA
 AATTCGTATT TGTGCGTGAT ACGGCAAGAA GAGTACATAT ATATATATGT

2 μ m Ori

1951 GGCAACACGC AGATATAGGT GCGACGTGAA CAGTGAGCTG TATGTGCGCA
 CCGTTGTGCG TCTATATCCA CGCTGCACTT GTCACTCGAC ATACACGCGT

2 μ m Ori

2001 GCTCGCGTTG CATTTTCGGA AGCGCTCGTT TTCGGAAACG CTTTGAAGTT
 CGAGCGCAAC GTAAAAGCCT TCGCGAGCAA AAGCCTTTGC GAAACTTCAA

2 μ m Ori

2051 CCTATTCCGA AGTTCCTATT CTCTAGAAAG TATAGGAACT TCAGAGCGCT
 GGATAAGGCT TCAAGGATAA GAGATCTTTC ATATCCTTGA AGTCTCGCGA

2 μ m Ori

2101 TTTGAAAACC AAAAGCGCTC TGAAGACGCA CTTTCAAAAA ACCAAAAACG
 AAACTTTTGG TTTTCGCGAG ACTTCTGCGT GAAAGTTTTT TGGTTTTTGC

2 μ m Ori

2151 CACCGGACTG TAACGAGCTA CTAAAATATT GCGAATACCG CTTCCACAAA
 GTGGCCTGAC ATTGCTCGAT GATTTTATAA CGCTTATGGC GAAGGTGTTT

2 μ m Ori

2201 CATTGCTCAA AAGTATCTCT TTGCTATATA TCTCTGTGCT ATATCCCTAT
 GTAACGAGTT TTCATAGAGA AACGATATAT AGAGACACGA TATAGGGATA

2 μ m Ori

2251 ATAACCTACC CATCCACCTT TCGCTCCTTG AACTTGCATC TAAACTCGAC
 TATTGGATGG GTAGGTGGAA AGCGAGGAAC TTGAACGTAG ATTTGAGCTG

2 μ m Ori

2301 CTCTACATTT TTTATGTTTA TCTCTAGTAT TACTCTTTAG ACAAAAAAAT
 GAGATGTAAA AAATACAAAT AGAGATCATA ATGAGAAATC TGTTTTTTTA

pJG4-5 (pB42AD)

2 μ m Ori

2351 TGTAGTAAGA ACTATTCATA GAGTGAATCG AAAACAATAC GAAAATGTAA
ACATCATTCT TGATAAGTAT CTCACTTAGC TTTTGTTATG CTTTTACATT

2 μ m Ori

2401 ACATTTCCCTA TACGTAGTAT ATAGAGACAA AATAGAAGAA ACCGTTTCATA
TGTAAGGAT ATGCATCATA TATCTCTGTT TTATCTTCTT TGGCAAGTAT

2 μ m Ori

2451 ATTTTCTGAC CAATGAAGAA TCATCAACGC TATCACTTTC TGTTACACAAA
TAAAAGACTG GTTACTTCTT AGTAGTTGCG ATAGTGAAAG ACAAGTGTTT

2 μ m Ori

2501 GTATGCGCAA TCCACATCGG TATAGAATAT AATCGGGGAT GCCTTTATCT
CATACGCGTT AGGTGTAGCC ATATCTTATA TTAGCCCCTA CGGAAATAGA

2 μ m Ori

2551 TGAAAAAATG CACCCGCAGC TTCGCTAGTA ATCAGTAAAC GCGGGAAGTG
ACTTTTTTAC GTGGGCGTCG AAGCGATCAT TAGTCATTTG CGCCCTTCAC

2 μ m Ori

2601 GAGTCAGGCT TTTTTTATGG AAGAGAAAAT AGACACCAAA GTAGCCTTCT
CTCAGTCCGA AAAAAATACC TTCTCTTTTA TCTGTGGTTT CATCGGAAGA

2 μ m Ori

2651 TCTAACCTTA ACGGACCTAC AGTGCAAAAA GTTATCAAGA GACTGCATTA
AGATTGGAAT TGCCTGGATG TCACGTTTTT CAATAGTTCT CTGACGTAAT

2 μ m Ori

2701 TAGAGCGCAC AAAGGAGAAA AAAAGTAATC TAAGATGCTT TGTTAGAAAA
ATCTCGCGTG TTTCCTCTTT TTTTCATTAG ATTCTACGAA ACAATCTTTT

2 μ m Ori

2751 ATAGCGCTCT CGGGATGCAT TTTTGTAGAA CAAAAAAGAA GTATAGATTC
TATCGCGAGA GCCCTACGTA AAAACATCTT GTTTTTTCTT CATATCTAAG

2 μ m Ori

2801 TTTGTTGGTA AAATAGCGCT CTCGCGTTGC ATTTCTGTTC TGTA AAAAATG
AAACAACCAT TTTATCGCGA GAGCGCAACG TAAAGACAAG ACATTTTTTAC

2 μ m Ori

2851 CAGCTCAGAT TCTTTGTTTG AAAAATTAGC GCTCTCGCGT TGCATTTTTTG
GTCGAGTCTA AGAAACAAAC TTTTAAATCG CGAGAGCGCA ACGTAAAAAC

2 μ m Ori

2901 TTTTACAAAA ATGAAGCACA GATTCTTCGT TGGTAAAATA GCGCTTTCGC
AAAATGTTTT TACTTCGTGT CTAAGAAGCA ACCATTTTAT CGCGAAAGCG

2 μ m Ori

2951 GTTGCATTTT TGTTCTGTAA AAATGCAGCT CAGATTCTTT GTTTGAAAAA
CAACGTAAAG ACAAGACATT TTTACGTCGA GTCTAAGAAA CAAACTTTTT

pJG4-5 (pB42AD)

2 μ m Ori

3001 TTAGCGCTCT CGCGTTGCAT TTTTGTTCCTA CAAAATGAAG CACAGATGCT
AATCGCGAGA GCGCAACGTA AAAACAAGAT GTTTTACTTC GTGTCTACGA

2 μ m Ori

3051 TCGTTAACAA AGATATGCTA TTGAAGTGCA AGATGGAAAC GCAGAAAATG
AGCAATTGTT TCTATACGAT AACTTCACGT TCTACCTTTG CGTCTTTTAC

2 μ m Ori

3101 AACCGGGGAT GCGACGTGCA AGATTACCTA TGCAATAGAT GCAATAGTTT
TTGGCCCCTA CGCTGCACGT TCTAATGGAT ACGTTATCTA CGTTATCAAA

2 μ m Ori

3151 CTCCAGGAAC CGAAATACAT ACATTGTCTT CCGTAAAGCG CTAGACTATA
GAGGTCCTTG GCTTTATGTA TGTAACAGAA GGCATTTTCG CATTCTGATAT

2 μ m Ori

3201 TATTATTATA CAGGTTCAAA TATACTATCT GTTTCAGGGA AAACCTCCAG
ATAATAATAT GTCCAAGTTT ATATGATAGA CAAAGTCCCT TTTGAGGGTC

2 μ m Ori

3251 GTTCGGATGT TCAAATTCA ATGATGGGTA ACAAGTACGA TCGTAAATCT
CAAGCCTACA AGTTTTAAGT TACTACCCAT TGTTTCATGCT AGCATTTAGA

2 μ m Ori

3301 GTAAAACAGT TTGTCGGATA TTAGGCTGTA TCTCCTCAAA GCGTATTCGA
CATTTTGTCA AACAGCCTAT AATCCGACAT AGAGGAGTTT CGCATAAGCT

2 μ m Ori

3351 ATATCATTGA GAAGCTGCAG GCAAGTGCAC AAACAATACT TAAATAAATA
TATAGTAACT CTTCGACGTC CGTTCACGTG TTTGTTATGA ATTTATTTAT

TRP1 Gene

3401 CTA~~CT~~CAGTA ATAACCTATT TCTTAGCATT TTTGACGAAA TTTGCTATTT
GATGAGTCAT TATTGGATAA AGAATCGTAA AAAC~~TG~~CTTT AAACGATAAA

TRP1 Gene

3451 TGTTAGAGTC TTTTACACCA TTTGTCTCCA CACCTCCGCT TACATCAACA
ACAATCTCAG AAAATGTGGT AAACAGAGGT GTGGAGGCGA ATGTAGTTGT

TRP1 Gene

3501 CCAATAACGC CATT~~TA~~ATCT AAGCGCATCA CCAACATTTT CTGGCGTCAG
GGTTATTGCG GTAAATTAGA TTCGCGTAGT GGTTGTAAAA GACCGCAGTC

TRP1 Gene

HindIII

3551 TCCACCAGCT AACATAAAAT GTAAGCTTTC GGGGCTCTCT TGCCTTCCAA
AGGTGGTCGA TTGTATTTTA CATT~~CG~~AAAG CCCCAGAGAGA ACGGAAGGTT

TRP1 Gene

pJG4-5 (pB42AD)

3601 CCCAGTCAGA AATCGAGTTC CAATCCAAA GTTCACCTGT CCCACCTGCT
GGGTCAGTCT TTAGCTCAAG GTTAGGTTTT CAAGTGGACA GGGTGGACGA

TRP1 Gene

3651 TCTGAATCAA ACAAGGGAAT AAACGAATGA GGTTTCTGTG AAGCTGCACT
AGACTTAGTT TGTTCCCTTA TTTGCTTACT CCAAAGACAC TTCGACGTGA

TRP1 Gene

3701 GAGTAGTATG TTGCAGTCTT TTGGAAATAC GAGTCTTTTA ATAACTGGCA
CTCATCATAAC AACGTCAGAA AACCTTTATG CTCAGAAAAT TATTGACCGT

TRP1 Gene

3751 AACCGAGGAA CTCTTGGTAT TCTTGCCACG ACTCATCTCC ATGCAGTTGG
TTGGCTCCTT GAGAACCATA AGAACGGTGC TGAGTAGAGG TACGTCAACC

TRP1 Gene

3801 ACGATATCAA TGCCGTAATC ATTGACCAGA GCCAAAACAT CCTCCTTAGG
TGCTATAGTT ACGGCATTAG TAACTGGTCT CGGTTTTGTA GGAGGAATCC

TRP1 Gene

3851 TTGATTACGA AACACGCCAA CCAAGTATTT CGGAGTGCCT GAACTATTTT
AACTAATGCT TTGTGCGGTT GGTTCATAAA GCCTCACGGA CTTGATAAAA

TRP1 Gene

3901 TATATGCTTT TACAAGACTT GAAATTTTCC TTGCAATAAC CGGGTCAATT
ATATACGAAA ATGTTCTGAA CTTTAAAAGG AACGTTATTG GCCCAGTTAA

TRP1 Gene

3951 GTTCTCTTTC TATTGGGCAC ACATATAATA CCCAGCAAGT CAGCATCGGA
CAAGAGAAAG ATAACCCGTG TGTATATTAT GGGTCGTTCA GTCGTAGCCT

TRP1 Gene

4001 ATCTAGAGCA CATTCTGCGG CCTCTGTGCT CTGCAAGCCG CAAACTTTCA
TAGATCTCGT GTAAGACGCC GGAGACACGA GACGTTCCGC GTTTGAAAGT

TRP1 Gene

4051 CCAATGGACC AGAACTACCT GTGAAATTAA TAACAGACAT ACTCCAAGCT
GGTTACCTGG TCTTGATGGA CACTTTAATT ATTGTCTGTA TGAGGTTCGA

TRP1 Gene

4101 GCCTTTGTGT GCTTAATCAC GTATACTCAC GTGCTCAATA GTCACCAATG
CGGAAACACA CGAATTAGTG CATATGAGTG CACGAGTTAT CAGTGTTTAC

TRP1 Gene

4151 CCCTCCCTCT TGGCCCTCTC CTTTTCTTTT TTCGACCGAA TTTCTTGAAG
GGGAGGGAGA ACCGGGAGAG GAAAAGAAA AAGCTGGCTT AAAGAACTTC

TRP1 Gene

4201 ACGAAAGGC CTCGTGATAC GCCTATTTTT ATAGGTTAAT GTCATGATAA
TGCTTTCCCG GAGCACTATG CGGATAAAA TATCCAATTA CAGTACTATT

4251 TAATGGTTTC TTAGACGTCA GGTGGCACTT TTCGGGGAAA TGTGCGCGGA
ATTACCAAAG AATCTGCAGT CCACCGTGAA AAGCCCTTT ACACGCGCCT

pJG4-5 (pB42AD)

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4301 ACCCCTATTT GTTTATTTTT CTAAATACAT TCAAATATGT ATCCGCTCAT
      TGGGGATAAA CAAATAAAAA GATTTATGTA AGTTTATAACA TAGGCGAGTA
      ampR
4351 GAGACAATAA CCCTGATAAA TGCTTCAATA ATATTGAAAA AGGAAGAGTA
      CTCTGTTATT GGGACTATTT ACGAAGTTAT TATAACTTTT TCCTTCTCAT
      ampR
4401 TGAGTATTCA ACATTTCCGT GTCGCCCTTA TTCCCTTTTT TGCGGCATT
      ACTCATAAGT TGTAAGGCA CAGCGGGAAT AAGGGAAAAA ACGCCGTAAA
      ampR
4451 TGCCTTCCTG TTTTGTCTCA CCCAGAAACG CTGGTGAAAG TAAAAGATGC
      ACGGAAGGAC AAAAACGAGT GGGTCTTTGC GACCACTTTC ATTTTCTACG
      ampR
4501 TGAAGATCAG TTGGGTGCAC GAGTGGGTTA CATCGAACTG GATCTCAACA
      ACTTCTAGTC AACCCACGTG CTCACCCAAT GTAGCTTGAC CTAGAGTTGT
      ampR
4551 GCGGTAAGAT CCTTGAGAGT TTTTCGCCCCG AAGAACGTTT TCCAATGATG
      CGCCATTCTA GGAACCTCTA AAAGCGGGGC TTCTTGCAAA AGGTTACTAC
      ampR
4601 AGCACTTTTA AAGTTCTGCT ATGTGGCGCG GTATTATCCC GTGTTGACGC
      TCGTGAAAAT TTCAAGACGA TACACCGCGC CATAATAGGG CACAACCTGCG
      ampR
4651 CGGGCAAGAG CAACTCGGTC GCCGCATACA CTATTCTCAG AATGACTTGG
      GCCCGTTCTC GTTGAGCCAG CGGCGTATGT GATAAGAGTC TTACTGAACC
      ampR
4701 TTGAGTACTC ACCAGTCACA GAAAAGCATC TTACGGATGG CATGACAGTA
      AACTCATGAG TGGTCAGTGT CTTTTCGTAG AATGCCTACC GTACTGTCAT
      ampR
4751 AGAGAATTAT GCAGTGCTGC CATAACCATG AGTGATAACA CTGCGGCCAA
      TCTCTTAATA CGTCACGACG GTATTGGTAC TCACTATTGT GACGCCGGTT
      ampR
4801 CTTACTTCTG ACAACGATCG GAGGACCGAA GGAGCTAACC GCTTTTTTGC
      GAATGAAGAC TGTTGCTAGC CTCCTGGCTT CCTCGATTGG CGAAAAACG
      ampR
4851 ACAACATGGG GGATCATGTA ACTCGCCTTG ATCGTTGGGA ACCGGAGCTG
      TGTTGTACCC CTTAGTACAT TGAGCGGAAC TAGCAACCCT TGGCCTCGAC
      ampR
4901 AATGAAGCCA TACCAAACGA CGAGCGTGAC ACCACGATGC CTGTAGCAAT
      TTAATTTCGGT ATGGTTTGTG GCTCGCACTG TGGTGCTACG GACATCGTTA
  
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pJG4-5 (pB42AD)

ampR

4951 GGCAACAACG TTGCGCAAAC TATTAACTGG CGAACTACTT ACTCTAGCTT
CCGTTGTTGC AACGCGTTTG ATAATTGACC GCTTGATGAA TGAGATCGAA

ampR

5001 CCCGGCAACA ATTAATAGAC TGGATGGAGG CGGATAAAGT TGCAGGACCA
GGGCCGTTGT TAATTATCTG ACCTACCTCC GCCTATTTC ACGTCCTGGT

ampR

5051 CTTCTGCGCT CGGCCCTTCC GGCTGGCTGG TTTATTGCTG ATAAATCTGG
GAAGACGCGA GCCGGGAAGG CCGACCGACC AAATAACGAC TATTTAGACC

ampR

5101 AGCCGGTGAG CGTGGGTCTC GCGGTATCAT TGCAGCACTG GGGCCAGATG
TCGGCCACTC GCACCCAGAG CGCCATAGTA ACGTCGTGAC CCCGGTCTAC

ampR

5151 GTAAGCCCTC CCGTATCGTA GTTATCTACA CGACGGGGAG TCAGGCAACT
CATTCGGGAG GGCATAGCAT CAATAGATGT GCTGCCCTC AGTCCGTTGA

ampR

5201 ATGGATGAAC GAAATAGACA GATCGCTGAG ATAGGTGCCT CACTGATTAA
TACCTACTTG CTTTATCTGT CTAGCGACTC TATCCACGGA GTGACTAATT

ampR

5251 GCATTGGTAA CTGTCAGACC AAGTTTACTC ATATATACTT TAGATTGATT
CGTAACCATT GACAGTCTGG TTCAAATGAG TATATATGAA ATCTAACTAA

5301 TAAAACCTCA TTTTAAATTT AAAAGGATCT AGGTGAAGAT CCTTTTTGAT
ATTTTGAAGT AAAAATTAAT TTTTCCTAGA TCCACTTCTA GGAAAACTA

5351 AATCTCATGA CAAAATCCC TTAACGTGAG TTTTCGTTCC ACTGAGCGTC
TTAGAGTACT GGTTTTAGGG AATTGCACTC AAAAGCAAGG TGA CTGCGCAG

5401 AGACCCCGTA GAAAAGATCA AAGGATCTTC TTGAGATCCT TTTTTTCTGC
TCTGGGGCAT CTTTTCTAGT TTCCTAGAAG AACTCTAGGA AAAAAAGACG

5451 GCGTAATCTG CTGCTTGCAA ACAAAAAAAC CACCGCTACC AGCGGTGGTT
CGCATTAGAC GACGAACGTT TGTTTTTTTTG GTGGCGATGG TCGCCACCAA

pUC ori

5501 TGTTTGCCGG ATCAAGAGCT ACCAACTCTT TTTCCGAAGG TAACTGGCTT
ACAAACGGCC TAGTTCTCGA TGGTTGAGAA AAAGGCTTCC ATTGACCGAA

pUC ori

5551 CAGCAGAGCG CAGATACCAA ATACTGTCCT TCTAGTGTAG CCGTAGTTAG
GTCGTCTCGC GTCTATGGTT TATGACAGGA AGATCACATC GGCATCAATC

pUC ori

5601 GCCACCACTT CAAGAACTCT GTAGCACCGC CTACATACCT CGCTCTGCTA
CGGTGGTGAA GTTCTTGAGA CATCGTGGCG GATGTATGGA GCGAGACGAT

pUC ori

5651 ATCCTGTTAC CAGTGGCTGC TGCCAGTGGC GATAAGTCGT GTCTTACCGG
TAGGACAATG GTCACCGACG ACGGTCACCG CTATTCAGCA CAGAATGGCC

pJG4-5 (pB42AD)

pUC ori

5701 GTTGGACTCA AGACGATAGT TACCGGATAA GGCGCAGCGG TCGGGCTGAA
CAACCTGAGT TCTGCTATCA ATGGCCTATT CCGCGTCGCC AGCCCGACTT

pUC ori

5751 CGGGGGGTTT GTGCACACAG CCCAGCTTGG AGCGAACGAC CTACACCGAA
GCCCCCAAG CACGTGTGTC GGGTCGAACC TCGCTTGCTG GATGTGGCTT

pUC ori

5801 CTGAGATACC TACAGCGTGA GCTATGAGAA AGCGCCACGC TTCCCGAAGG
GACTCTATGG ATGTCGCACT CGATACTCTT TCGCGGTGCG AAGGGCTTCC

pUC ori

5851 GAGAAAGGCG GACAGGTATC CGGTAAGCGG CAGGGTCGGA ACAGGAGAGC
CTCTTTCCGC CTGTCCATAG GCCATTGCC GTCCCAGCCT TGTCTCTCG

pUC ori

5901 GCACGAGGGA GCTTCCAGGG GGAAACGCCT GGTATCTTTA TAGTCCTGTC
CGTGCTCCCT CGAAGGTCCC CCTTTGCGGA CCATAGAAAT ATCAGGACAG

pUC ori

5951 GGGTTTCGCC ACCTCTGACT TGAGCGTCGA TTTTTGTGAT GCTCGTCAGG
CCCAAAGCGG TGGAGACTGA ACTCGCAGCT AAAAACTA CGAGCAGTCC

pUC ori

6001 GGGGCGGAGC CTATGGAAAA ACGCCAGCAA CGCGGCCTTT TTACGGTTCC
CCCCGCTCG GATACCTTTT TGCGGTCGTT GCGCCGAAA AATGCCAAGG

6051 TGGCCTTTTG CTGGCCTTTT GCTCACATGT TCTTTCCTGC GTTATCCCCT
ACCGAAAAC GACCGGAAAA CGAGTGTACA AGAAAGGACG CAATAGGGGA

6101 GATTCTGTGG ATAACCGTAT TACCGCCTTT GAGTGAGCTG ATACCGCTCG
CTAAGACACC TATTGGCATA ATGGCGGAAA CTCACTCGAC TATGGCGAGC

6151 CCGCAGCCGA ACGACCGAGC GCAGCGAGTC AGTGAGCGAG GAAGCGGAAG
GGCGTCGGCT TGCTGGCTCG CGTCGCTCAG TCACTCGCTC CTTCGCCTTC

6201 AGCGCCCAAT ACGCAAACCG CCTCTCCCCG CGCGTTGGCC GATTCATTAA
TCGCGGGTTA TCGGTTTGGC GGAGAGGGGC GCGCAACCGG CTAAGTAATT

6251 TGCAGCTGGC ACGACAGGTT TCCCGACTGG AAAGCGGGCA GTGAGCGCAA
ACGTCGACCG TGCTGTCCAA AGGGCTGACC TTTCGCCCGT CACTCGCGTT

6301 CGCAATTAAT GTGAGTTAGC TCACTCATTA GGCACCCAG GCTTTACTACT
GCGTTAATTA CACTCAATCG AGTGAGTAAT CCGTGGGGTC CGAAATGTGA

6351 TTATGCTTCC GGCTCGTATG TTGTGTGGAA TTGTGAGCGG ATAACAATTT
AATACGAAGG CCGAGCATAA AACACACCTT AACACTCGCC TATTGTTAAA

6401 CACACAGGAA ACAGCTATGA CATGATTACG AATTAATTTCG AGCTCGGTA
GTGTGTCCTT TGTCGATACT GACTAATGC TTAATTAAGC TCGAGCCAT