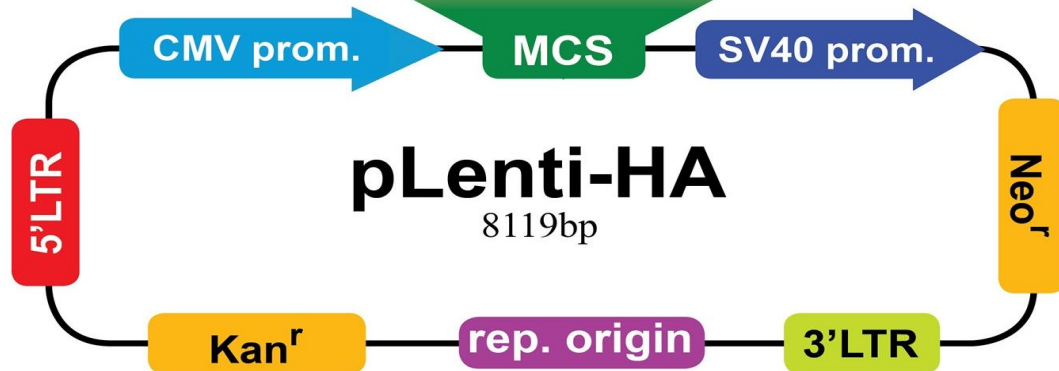


Vector Name	pLenti-Easy-HA
VectorType	Lentiviral vector
Antibiotic Information	Kanamycin
Sequencing Primers	CMV sequencing primer 5'---CGC AAA TGG GCG GATGGC GTG---3'

```

          KpnI      XhoI      AvrII      ApaI      ScaI
5'-- GGT ACC CTC GAG CCT AGG GGG CCC AGT
          XbaI      SacI      SpeI      NotI
ACT TCT AGA CCG CGG ACT AGT GCG GCC GCT
          BamHI   EcoRI      HA Tag
GGA TCC GAA TTC TAC CCA TAC GAC GTC CCA
          -----
GAC TAC GCT TGA --3'
  
```



```

1 ttttgattg aaagcaaat gataatgagg ggggtgagtt tgtgacgtgg cgcggggcgt
61 gggaaacggg cgggtgacgt agtagtgagg cggaagtgtg atgttgcaag tgtggcggaa
121 cacatgtaag cgacggatgt ggcaaaaagt acgttttttg tgtgcgccgg tgtacacagg
181 aagtgacaat ttctgcgcgg ttttaggcgg atgtttgtag aaatttgggc gtaacagagt
241 aagatttggc ctttttcgcg ggaaaaactga ataagaggaa gtgaaatctg aataattttg
301 gtttactcat agcgcgtaat acggcagacc tcagcgcctag attattgaag cttttatcag
361 ggttattgtc tcatgagcgg atacatatat gaatgtatatt agaaaaataa acaaataggg
421 gttccgcgca cttttcccg aaaagtgcc cctgacgtta actataacgg tcttaaggtta
481 gcgaaagctc agatctggat ctcccagatc cctatggtcg actctcagta caatctgctc
541 tgatgccgca tagttaagcc agtatctgct cctgcttgt gtgttgaggg tctgtgagta
601 gtgcccagc aaaatttaag ctacaacaag gcaaggcttg accgacaatt aatgtagtct
661 tatgcaatac tctgttagtc ttgcaaatg gtaacgatga gtttagcaaca tgccttaaca
721 ggagagaaaa agcaccgtgc atgcccattg gtggaagtaa ggtggtacga tctgtcctta
781 tttaggaaggc aacagacggg tctgacatgg attggacgaa ccaactgaatt gccgcattgc
841 agagatattg tatttaagt cctagctcga tacataaacg ggtctctctg gtttagaccg
901 atctgagcct gggagctctc tggctaacta gggaaccac tgcttaagcc tcaataaagc
961 ttgccttgag tgcttaagt agtgtgtgcc cgtctgttgt gtgactctgg taactagaga
1021 tccctcagac ctttttagtc agtgtgaaaa atctctagca gtggcggcgg aaacagggact
1081 tgaagcggaa agggaaacca gaggagctct ctgcagcag gactcggctt gctgaagcgc
1141 gcacggcaag aggcgagggg cggcgactgg tgagtacgcc aaaaattttg actagcggag
1201 gctagaagga gagagatggg tgcgagagcg tcaagtataa gcgggggaga attagatcgc
1261 gatgggaaaa aattcgggta aggccagggg gaaagaaaaa atataaatta aaacatatag
1321 tatgggcaag cagggagcta gaacgattcg cagttaatcc tggcctgtta gaaacatcag
1381 aaggctgtag acaaaactct ggacagctac aacctccct tcagacagga tcagaagaac
1441 ttagatcatt atataataca gtagcaacc cttattgtgt gcatcaaagg atagagataa
1501 aagacaccaa ggaagcttta gacaagatag aggaagagca aaacaaaagt aagaccaccg
1561 cacagcaagc gccgctgctc ttcagacctg gaggaggaga tatgagggac aattgagaag
1621 tgaattatat aaatataaag tagtaaaaat tgaaccatta ggagtagcac ccaccaagc
1681 aaagagaaga gtggtgcaga gaaaaaaaag agcagtgagg ataggagctt tttctctgg
1741 gttcttggga gcagcaggaa gcaactatgg cgcagcgtca atgacgtga cggtagcagg
1801 cagacaatta ttgtctggta tagtgcagca gcagaacaat ttgctgaggg ctattgaggc
1861 gcaacagcat ctgttgcaac tcacagctct gggcatcaag cagctccagg caagaatcct
1921 gctgttgtaa agatacctaa aggatcaaca gctcctgggg atttgggggt gctctggaaa
1981 acctatttgc acaactgctg tgccttgtaa tgctagtgtg agtaataaat ccttggaaca
2041 gatttggaa cacacgacct gtagtgagtg ggacagagaa attaacaatt acacaagctt
2101 aatacactcc ttaattgaag aatcgcaaaa ccagcaagaa aagaatgaac aagaattatt
2161 ggaattagat aaatgggcaa gtttggtaa ttggtttaac ataacaatt ggcgtgggta
2221 tataaaatta ttcataatga tagtaggagg cttggtaggt ttaagaatag tttttgctgt
  
```

2281 accttctata gtgaatagag ttaggcaggg atattcacca ttatcgtttc agaccaccc
2341 cccaaccocg aggggaccg acaggcccga aggaatagaa gaagaagtg gagagagaga
2401 cagagacaga tccattogat tagtgaacgg atctcagcgg tatcgataag cttgggagtt
2461 ccgcgttaca taacttacgg taaatggccc gcctggctga ccgcccacg acccccgccc
2521 attgacgtca ataatgacgt atgttcccat agtaacgcca atagggactt tccatcgacg
2581 tcaatgggtg gattatttac ggtaactgca ccacttgcca gtacatcaag tttatcatal
2641 gcoagtagc cccctatttg acgtcaatga cggtaaatgg cccgcctggc attatgcccc
2701 gtacatgacc ttatgggact ttctactctg gcagtaacac tacgtattag tccatcgctat
2761 taccatgggtg atgcccgttt ggccagtacat caatgggctg gtagtagcgt ttgactcacg
2821 gggatttoca agtctccacc ccaattgacgt caatgggagt ttgttttggc accaaaatca
2881 accggacttt ccaaaatgtc gtaacaactc cgcaccttg acgcaaatgg cggtagggcg
2941 tgtacggtgg gaggtctata taagcagagc togttttagt aaccgtcaga tccgctggag
3001 accccatoca cgtgtttttg acctccatag aagacaccgg ctacgcttta aacttaagct
3061 tggtagccctc gagcctaggg gcccagtagc ttctagaccg cggactagtg cggcctggg
3121 atccgaattc taccatagc acgtcccaga ctacgcttga tcccggctg tggatgtgt
3181 gtcagttagg gtgtggaaaag tcccaggct cccacagcgg cagaagtatg caaagcatg
3241 atctcaatta gtcagaacc aggtgtgaa agtccccagg ctcccagca ggcagaagta
3301 tgcaaaagcat gcatctcaat tagtcagcaa ccatagtcoc gccctaact cccccatcc
3361 cgcacctaac tccgcccagt tccgcccatt ctccgcccc tggctgacta atttttttta
3421 ttatgacaga gcccagggcc gctcggcct ctgagctatt ccagaagttag taggaggcg
3481 tttttggagg cctagtgacc agatctaatg cgtgctagt ttgcaaaaag cttgggctgc
3541 aggtcagggc gtagctgac aagagacagg atgagtagc tttcgcatga ttgaaaaca
3601 tggattgcac gcaggttctc cggccgcttg ggtggagagg ctattcggct atgactgggc
3661 acaacagaca atcggctgct ctgatgccgc cgtgtccgg ctgtcagcgc agggcgccc
3721 ggttcttttt gtaagaccg acctgtccgg tgcctgaaat gaactgcagg acgaggcagc
3781 cggctatcg ttgtggcca cgacgggct cctctgcca gctgtgctg acgttctcac
3841 tgaagcggga agggactggc tgcattggg cgaagtccg gggcaggatc tctgtcatc
3901 tcaacttgc cctgcccaga aagatccat catgctgat gcaatggcg ggtgcatc
3961 ttctgatccg gctacctgcc cactcgacca ccaagcgaaa catcgcatc agcagcagc
4021 tactcggatg gaagccggtc ttgtcgatca gtagtagctg gacgaagagc atcagggct
4081 cgcgccagcc gaactgttcg ccaggctcaa ggcgcgatg cccgacggcg aggatctctg
4141 cgtgaccat ggcgatgccc gcttgcgaa tatcatggtg gaaaatggcc gctttctgg
4201 attcatcgac tgggcccggc tgggtgtggc ggaccgctat caggacatag cttggctac
4261 ccgtgatatt gctgaagagc ttggcggcga atgggctgac cgtctctcg tctttacgg
4321 tctcgcgct cccgatctgc agcgcacgc cttctatgc cttctgacg agttctctg
4381 agcgggactc tggggttcca tatctagcga ccagatctaa tgcgtgctag aaggcagctg
4441 tagatcttag ccacttttta aaagaaaagg ggggactgga agggctaatt cactcccaac
4501 gaagacaaga tctgcttttt gcttctctg ggtctctctg gctagcagc cagatctaat
4561 gctgctagg agcctgggag cctctctggc aactagggaa cccactgctt aagcctcaat
4621 aaagctgccc ttgagtgtt caagtagtg gtgcccgtc gttgtgtgac tctggttaact
4681 agagatccct cagaccctt tagtcagtgt ggaaaatctc tagcagtagt agttcaatg
4741 atcttatatt tcagtattta taactgcaa agaaatgaa atcagagagt gagaggaact
4801 tgggcccagc cagatctaat cgttaggccc ttaaacccg tgatcagcct cagctgtgccc
4861 tcttagttgc cagccatctg ttgttgccc ggcgcgatg ctgcccctcc cccgtgctt
4921 ccttgaccct ggaaggtgccc actcccactg tcttctcta ataaaaagag gaaatgcat
4981 gcaattgtct gagtagtgt cactctattc tggggggtgg ggtgggccc gacagaagg
5041 gggaggattg ggaagacaat agcaggcatg ctggggatgc ggtgggctct atggctctg
5101 agcgggaaag aaccagcaga tcgatctgca tctatgtcgg gtgcccagaa agaggtaatg
5161 aaatggcatt atgggtatta tgggtctgca ttaatgaaat ggccaaagat cccggtgga
5221 aataccgccc agatgctgaa ggagaaaata ccgcatcagg cgtctctccg cttctctgct
5281 cactgactcg ctgcgctcgg tcgttcggct gcccgcagcg gtagcagctc actcaaaagg
5341 ggttaatacgg ttatccacag aatcagggga taacgcagga aagaacatgt gagcaaaagg
5401 ccagcaaaaag gccaggaacc gtaaaaaggc cgcgttctg gctttttcc ataggctccg
5461 cccccctgac gagcatcaca aaaatcgacg ctcaagtca aggtggcgaa accccagcgg
5521 actataaaga taccagcgtc ttcccctgg tcccctctc gtgcgctctc cgtttccagc
5581 cctgcccgtt accggatacc tgtcccctt tctcccctg ggaagcgtgg cgtttctca
5641 tagctcagc ttaggtatc tcagttcgtg ttaggtctgt cgtctcaagc tgggctgtgt
5701 gcaagcaacc cccgttcagc cgcagcctg cgccttacc ggtaactatc gcttctgac
5761 caaccgggta agacacgact tatcgcact ggcagcagcc actgtaaca ggattagcag
5821 agcaggtat gtaggcggtg ctacagagtt cttgaagtgg tggcctaact acggctacac
5881 tgaaggaca gatttggta tctgcgctc gctgaagcca gttaccttcg gaaaagagt
5941 tggtagctct tgatccggca acaaaaccac cgtggtagc ggtggtttt ttgtttgcaa
6001 gcagcagatt acgcccagaa aaaaaggatc tcaagaagat cctttgatc tttctacggg
6061 gctcagcgt cagtggaacg aaaaactcag ttaagggatt ttggtcatga gattatcaaa
6121 aaggatcttc acctagatcc ttttaaatc aaaaatgaa ttaaatcaa tctaaagtat
6181 atatgagtaa acttggctc acagttacca atgcttaac agttaggcac ctatctcagc
6241 gatctgtcta ttctgtctc ccatagttgc ctgactcccc gtcgtgtaga taactacgat
6301 accggagggc ttaccatctg gccccagtgc tgcaatgata cccgagacc cagctcacc
6361 ggtccagat ttatcagcaa taaccagcc agccggaagg gccgagcga gaagtgggccc
6421 tgcaacttta tccgctcca tccagtctat taattgttgc cgggaagcta gagtaagtag
6481 ttcgccaagt aatagtttgc gcaacgttgc tgaaaaagga tcttcaacta gatcctttc
6541 acgtagaag ccagtcgcca gaaacgggtg tgacccccga tgaaatgtag ctactgggct
6601 atctggacaa aagcgcgaag agaaagcagg agaaagcagg tagcttgcag tgggctaca
6661 tggcagtagc tagactgggc ggttttatgg acagcaagcg aaccggaatt gccagctggg
6721 gcccctctg gtaaggttgg gaagccctgc aaagtaaac ggttagctt ctccgcccga
6781 aggatctgat ggcgagggg atoaaactct gatcaagaga caggatgag atcgttctg
6841 atgattgaac aagatggatt gcaacgaggt tctccggcgg cttgggtgga gaggctatc
6901 ggcattgact gggcacaaca gacaatcggc tgctctgat cccgctgtgt cggctgtca
6961 ggcaggggc gcccggttct ttttgcagg accgacctgt cccgtgccc gaataactg
7021 caagacgagg cagcgggct atcgtggctg gccacgagc gcttctctg ccagctgtg
7081 ctgcagctg tcaactgaag ggaagggac tggctgctat tgggcaagt gccggggcag
7141 gatctctgt catctcact tgcctctgccc gagaaagtat gacatctggc tgatcaatg
7201 cggcggctgc atacgctga tccgctacc tgcccattog accccaagc gaaacatcgc
7261 atcagcagc cagctactgc gatggaagc ggtctgtog atcagatga tctggacgaa
7321 ggcacagc agccgactg agccgaactg tccgcccagg tcaagggag cagcccagc
7381 ggcaggatc tcgtctgac ccatggcgat gcctgcttgc cgaatatcat ggtgaaaaat



```

7441 ggccgctttt ctggattcat cgactgtggc cggctgggtg tggcggaccg ctatcaggac
7501 atagcgttgg ctaccctgga tattgctgaa gagcttggcg gcgaatgggc tgaccgcttc
7561 ctctgtcttt acggtatcgc cgctcccgat tcgcagcgca tcgccttcta tcgccttctt
7621 gacgagtctt tctgaatttt gttaaaattt ttgttaaact agctcatttt ttaaccaata
7681 ggccgaaatc ggcaacatcc cttataaatc aaaagaatag acccgcatag ggttgagtgt
7741 tgttccagtt tggacaaga gtocactatt aaagaactgt gactccaacg tcaaaggggc
7801 aaaaccgtc tatcagggcg atggcccact acgtgaacca tcacccaat caagtttttt
7861 gcggtcgagg tgccgtaag ctctaaatcg gaaccctaaa gggagcccc gatttagagc
7921 ttgacgggga aagccggcga acgtggcgag aaaggaaggg aagaagcga aaggagcggg
7981 cgttagggcg ctggcaagtg tagcggtcac gctgcgcgta accaccacac ccgcgcgctt
8041 aatgcgccc tacagggcg gtccattcgc cattcaggat cgaattaatt cttaattaac
8101 atcatcaata atatacctt

```

```

//
LOCUS      dna                      8119 bp

```

```

FEATURES             Location/Qualifiers
     Other Gene       162..310
                     /gene="Encap other"
     Promoter         365..393
                     /gene="amp prom"
     misc_binding     457..462
                     /dbxref="REBASE:HpaI"
     regulatory_sequence..1151
                     /gene="5'-LTR"
     Other Gene       880..1060
                     /gene="HIV-1_5_LTR other"
     Other Gene       1171..1215
                     /gene="HIV-1_psi_pack other"
     misc_binding     1257..1262
                     /dbxref="REBASE:NruI"
     Regulatory_Seq   1723..1956
                     /gene="RRE reg"
     ORF              1766..2449
                     /sequence="ORF_2 rf(2)"
     promoter         2450..3020
                     /gene="CMV "
     misc_binding     2636..2641
                     /dbxref="REBASE:NdeI"
     Promoter         2911..2992
                     /gene="CMV prom"
     misc_binding     3062..3067
                     /dbxref="REBASE:KpnI"
     misc_binding     3068..3073
                     /dbxref="REBASE:XhoI"
     misc_binding     3080..3085
                     /dbxref="REBASE:ApaI"
     misc_binding     3092..3097
                     /dbxref="REBASE:XbaI"
     misc_binding     3110..3117
                     /dbxref="REBASE:NotI"
     misc_binding     3119..3124

```

Gentaur Molecular Products
Voortstraat 49
1910 Kampenhout, Belgium

```

        /dbxref="REBASE:BamHI"
misc_binding    3125..3130
        /dbxref="REBASE:EcoRI"
tag            3130..3160
        /gene="HA "
Regulatory_Seq 3167..3403
        /gene="SV40ER reg"
Promoter       3190..3458
        /gene="SV40 prom"
Rep_Origin     3357..3434
        /gene="SV40 origin"
misc_binding   3437..3449
        /dbxref="REBASE:SfiI"
misc_binding   3488..3493
        /dbxref="REBASE:StuI"
origin_of_replication.4379
        /gene="Neo/Kan"
ORF            3587..4381
        /sequence="ORF_3 rf(2) "
misc_binding   4399..4404
        /dbxref="REBASE:EcoRV"
Other Gene     4477..4529
        /gene="delta_U3 other"
origin_of_replication.4790
        /gene="3' -LTR"
misc_binding   4887..4892
        /dbxref="REBASE:SmaI"
misc_binding   4887..4892
        /dbxref="REBASE:XmaI"
Rep_Origin     5431..6050
        /gene="pBR322 origin"
Promoter       6703..6752
        /gene="NEOKAN prom"
ORF            6841..7635
        /sequence="ORF_1 rf(1) "
Rep_Origin     7740..8045
        /gene="f1 origin"

```

BASE COUNT 2066 a 1918 c 2241 g 1894 t 0 others

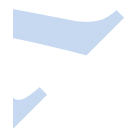
ORIGIN

```

1 ttttgattg aagccaatat gataatgagg gggtaggtt tgtgacgtgg cgcggggcgt
61 gggaacgggg cgggtgacgt agtagtgtgg cggaagtgtg atgttgcaag tgtggcggaa
121 cacatgtaag cgacggatgt ggcaaaagtg acgttttttg tgtgcgccgg tgtacacagg
181 aagtgacaat tttcgcgcgg ttttaggcgg atgttgtagt aaatttgggc gtaaccgagt
241 aagatttggc cattttcgcg ggaaaactga ataagaggaa gtgaaatctg aataattttg
301 tgttactcat agcgcgtaat acggcagacc tcagcgttag attattgaag catttatcag
361 gttattgtc tcattgagcg atacatatatt gaatgtattt agaaaaataa acaaataggg

```

421 gttccgcgca cattiecccg aaaagtgcc cctgacgtta actataacgg tctaagta
481 gogaaagctc agatctggat ctcccgatcc cctatggctc actctcagta caatctgtc
541 tgatgcccga tagttaagcc agtatctgct cctctgctgt gtgttgaggg tctgtgagta
601 gtgcccgcgagc aaaatttaag ctacaacaag gcaaggcttg accgacaatt aatgtagctc
661 tatgcaatc tctgtagtc ttgcaacatg gtaacgatga gttagcaaca tgccttaca
721 ggagagaaaa agcacctgtc atgccgattg gtggaagtaa ggtggtacga tctgtcctta
781 ttaggaaagc aacagacggg tctgacatgg atggagcga ccaactgaatt gccgcattgc
841 agagatattg tatttaagtg cctagctcga tacataaacg ggtctctctg gttagaccag
901 atctgagcct gggagctctc tggctaacta gggaaaccac tgcttaagcc tcaataaagc
961 ttgccttgag tgcttcaagt agtgtgtgcc cgtctgtgtg gtgactctgg taactagaga
1021 tccctcagac ccttttagtc agtgtggaaa atctctagca gtggcgcccg aacagggact
1081 tgaagcgaag agggaaacca gaggagctct ctgcacgcag gactcggctt gctgaagcgc
1141 gcacggcaag aggcgagggg cggcgactgg tgagtacgcc aaaaattttg actagcggag
1201 gctagaagga gagagatggg tgcgagagcg tcagtattaa cggggggaga attagctgc
1261 gatgggaaaa aattogggta aggccagggg gaagaaaaa atataaatta aaacataatg
1321 tatgggcaag cagggagcga gaacgatctg cagttaatcc tggcctgta gaaacatcag
1381 aaggctgtag acaaatcctg ggacagctac aacctccctc tcagacagga tcaaggaac
1441 ttagatcatt atataataca gtagcaacc tctattgtgt gcatcaaagg atagagata
1501 aagacaccaa ggaagcttta gacaagatag aggaagagca aacaaaagt aagaccaccg
1561 cacagcaagc gccctgatac ttcagacctg gaggaggaga tatgagggac aatggagaag
1621 tgaattatat aataataaag tagtaaaaat tgaaccatta ggagtacac ccaccaaggc
1681 aaagagaaga gtggtgcaga gagaaaaaag agcagtgga ataggagctt tgttctctgg
1741 gttcttggga gcagcaggaa gcactatggg ccagcgtca atgacgtga cgttacaggc
1801 cagacaatta ttgtctggta tagtgcaaga gcagaacaat ttgctgaggg ctattgagcc
1861 gcaacagcat ctggtgcaac tcacagctctg gggcatcaag cagctccagg caagaatcct
1921 ggctgtggaa agatcactaa aggatcaaca gctcctgggg atttggggtt gctctggaaa
1981 actcatttgc accactgctg tgccttgga tgctagtgg agtaataaat ctctggaaca
2041 gatttggaa cacacgacct ttaattgaag aatcgcaaaa ccagcaagaa aagaatgaac
2101 aatacactcc ttaattgaag aatcgcaaaa ccagcaagaa aagaatgaac aagaattatt
2161 ggaattagat aatgggcaa gtttgtggaa ttggtttaac ataaacaatt ggctgtggta
2221 tataaaatta ttcataatga tagtaggagg ctgtgtagg ttaagaatag tttttgtgt
2281 actttotata gtgaatagag ttaggcaggg atattcacca ttatcgttcc agacaccct
2341 cccaaccocg aggggaccocg acaggcccca aggaatagaa gaagaaggtg gagagagaga
2401 cacagacaga tccattcgat tagtgaacgg atctgcagcg tatcgataag ctgtggagtt
2461 ccgctttaca taacttacgg taaatggccc gctctgctga ccgcccacgc acccccoccc
2521 attgacgtca ataataagct atgttcccat agtaacgcca atagggactt tccattgacg
2581 tcaatgggtg gagtatttac ggtaaactgc ccacttggca gtacatcaag tgtatcat
2641 gccaaagtag cccoctattg acgtcaatga cgttaaatgg cccgctggc attatgcca
2701 gtacatgacc ttatgggact ttccactctg gcagtagatc tacgtattag tcatcgtcat
2761 taccatgggt atgctggttt ggcagtagat caatgggctt ggtatggctt tgactcaat
2821 ggatatttca agtctccacc ccattgacgt caatgggagt ttgttttggc accaaaatca
2881 acgggacttt ccaaaatgct gtaacaactc cgcctcattg acgcaaatgg gcggtaggcg
2941 tgtacggtg gaggtctata taagcagagc tctgttagtg aacgctcaga tgcctggag
3001 acgcatcca cgtgttttg acctccatag aagacaccgg cttagcgtta aacttaagct
3061 tggtaaccct gagcctaggg ggcccagtag ttctagaccg cggacttagt cggccgctgg
3121 atccgaatc taccoatag acgtcccaga ctacgcttga tcccggctg tggaaatgtg
3181 gtcagttagg gtgtggaaag tccccaggtc cccagcagc cagaagtagt caaagatgct
3241 atctcaatta gtcagcaacc aggtgtggaa agtcccagc ctcccagca ggcagaagta
3301 tgcaaaagc gcatctcaat tagtcagcaa ccatagctcc gccctcaact ccgccaatcc
3361 cgcctcaatc tccgcccagt tccgcccatt ctccgcccga ttgctgacta atttttttta
3421 tttatgcaga ggcgagggcc gcctcggcct ctgagctatt ccagaagtag tgaggaggct
3481 tttttggagg cctagtgaac agatcctaat cgtgctagt ttgcaaaaag ctgtggctgc
3541 aggtcagagg ggtatctgac aagagacagg atgaggatcg tttcgcata ttgaacaaga
3601 tggattgcac gcaggttctc cggccgcttg ggtggagagg ctattcggct atgactgggc
3661 acaacagaca atcggctgct ctgatgccc cgtgttcccg ctgtcagcgc aggggcccoc
3721 ggttcttttt gtcaagaccg acctgtccgg tgcctgaat gaactgcagg acgaggcagc
3781 gcggctatcg tggctggcca cgcagggcgt tctctgcga gctgtgctcg acgttctcac
3841 tgaagcggga agggactggc ttgtctatgg cgaagtgcgc gggcaggatc tctgtctac
3901 tcaacttctg cctgcccaga aagtatccat catggctgat gcaatgcccg ggtgcatc
3961 cgttgatccg gctaacctgc cattcgacca ccaagcgaat catcgcacg agcagacag
4021 tactcggatg gaagcggctc ttgtctatgg ggtatgctc gacgaagagc atcagggct
4081 cgcgcccagc gaactgtctg ccaggctcaa ggcgcccag cccgaaggcg aggatctcgt
4141 cgtgaccat ggcgatcctt gcttgcgcaa tatcatggtg gaaaatggcc gctttctg
4201 attcatgac tgtggccggc tgggtgtggc ggaccgctat caggacatag cgttggctac
4261 cogtgatatt gctgaagagc ttggcggcga atgggctgac cgttctctog tcttctacg
4321 tatcggcctc cccgatctgc agcgcacgct ctctctatgc cttcttgagc agttctctg
4381 agcgggactc tggggtcga tatctagcga ccagatctaa tgcgtgctag aaggcagctg
4441 tagatcttag ccacttttta aaagaaaagg gggacttgg agggctaatt cactccaac
4501 gaagacaaga tctgcttttt gctgttactg ggtctctctg gcttagcagc cagatctaat
4561 gcgtgctagg agcctgggag ctctctggct aactagggaa cccactgctt aagcctcaat
4621 aaagcttgcc ttgagtgctt caagtagtgt gtgcccgtct gttgtgtgac tctggttaact
4681 agagatccct cagacccttt tagtcagtgt ggaaaaatct tagcagtagt agttcatgct
4741 atcttattat tcagtattta taacttgcaa agaaaatgaat atcagagagt gagaggaact
4801 tgggcccagc cagatctaat gcgtaggccg tttaaaccgc tgatcagcct cgaactgtcc
4861 ttctagtgtc cagccatctg ttgttgcccg ggcgcgatcg ctgcccctcc cccgtgctt
4921 ccttgacctt ggaaggtgcc actcccactg tcttttcta ataaaaatag gaaatgcat
4981 cgcattgtct gagtagtgtt cattctattc tggggggtgg ggtggggcag gacagcaagg
5041 gggaggattg ggaagacaat agcaggcatg ctggggatgc ggtgggctct atggctctg
5101 agcgggaaag aaccagcaga tgcactgca tctatgtcgg gtgcccagaa agaggttaag
5161 aatggcatt atgggtatta tgggtctgca ttaatgaatc ggccaacgat cccggtgta
5221 aataccgac agatgctgaa ggagaaaaa cgcacatcag cgtctctccg ctctctcgt
5281 cactgactog ctgctctcgg tcttctggct gggcgagcg gatacagct actcaaaagg
5341 ggtaatacgg ttatccacag aatcagggga taacgcagga aagaacatgt gagcaaaagg
5401 ccagcaaaag gccaggaacc gtaaaaaggc cgcgttctg cgtttttcc ataggctcgg
5461 ccccctgac gagcatcaca aaaaatcagc ctcaagtcag aggtggcga accgcagag
5521 actataaaga taccaggcgt tccccctgg aagctccctc gtgctctctc ctgttccgac



5581 cctgcccgtt accggatacc tgtcccctt tctcccctcg ggaagcgtgg cgctttctca
5641 tagctcaacc tgtaggatc tcagttcgtt gtaggtcgtt cgctccaagc tgggctgtgt
5701 gcacgaaccc cccgttcagc ccgaccgctg cgccctatcc ggtaactatc gtcttgagtc
5761 caaccocgta agacacgact tatcgccaact ggcagcagcc actggttaaca ggattagcag
5821 agcagaggtat gtaggcggtg ctacagagtt ctggaagtgg tggcctaact acgctacac
5881 tagaaggaca gtatttggta tctgcgctct gctgaagcca gttaccttcg gaaaagagt
5941 tggtagctct tgatccggca acaaaaccac cgctggtagc ggtggttttt ttgtttgcaa
6001 gcagcagatt acgcgcaaaa aaaaaggatc tcaagaagat cctttgatct tttctacggg
6061 gtctgacgct cagtggaaac aaaactcacg ttaagggatt ttggtcatga gattatcaaa
6121 aaggatcttc acctagatcc ttttaaatta aaaatgaagt tttaaatcaa tctaaagtat
6181 atatgagtaa acttggctcg acagttacca atgcttaatc agtgaggcac ctatctcagc
6241 gatctgteta tttcgttcat ccatagttgc ctgactcccc gtcgtgtaga taactacgat
6301 acgggagggc ttaccatctg gccccagtcg tccaatgata ccgcgagacc cacgctcacc
6361 agctccagat ttatcagcaa taaaccagcc agccggaagg gccgagcgca gaagtgtcc
6421 tgcaacttta tccgctcca tccagtctat taattgttgc cgggaagcta gagtaagtag
6481 ttcgcccgtt aatagtttgc gcaacgttgt tgaaaaagga tcttcaacct gatccttttc
6541 acgtagaag acgtccgca gaaacgttgc tgaccocgga tgaatgtcag ctactcggct
6601 atctggacaa gggaaaaacg aagcgcaag agaaagcagg tagcttgacg tgggcttaca
6661 tggcgatagc tagactgggc ggttttatgg acagcaagcg aaccggaatt gccagctggg
6721 gcgcccctcg gtaaggttgg gaagccctgc aaagtaaac ggatggcttt ctgcgccca
6781 aggatctgat ggcgagggg atcaagctct gatcaagaga caggatgagg atcgtttcgc
6841 atgattgaac aagatggatt gcacgcaggt tctcccggcg cttgggtgga gaggctatcc
6901 ggcctagact gggcacaaca gacaatcgcc tgctctgatg ccgcccgttt ccgctgtca
6961 gcgaggggc gcccggtct tttgtcaag accgacctgt ccggtgccct gaatgaaactg
7021 caagacgagg cagcgcggct atcgtggctg gccacgacgg cgttctctg cgcagctgtg
7081 ctcgacgttg tcaactgaag ggaagggac tggctgctat tgggcaaggt gccggggcag
7141 gatctcctgt catctcaact tgcctctgcc gagaaagtat ccatcatggc tgatgcaatg
7201 cggcggtgac atacgcttga tccggctacc tgccattcg accccaagc gaaacatcgc
7261 atcgagcgag cactgactcg gatggaagcc ggtctgtgag atcaggatga tctggacgaa
7321 gagcatcagg ggcctcgccc agccgaactg ttcgcccagg tcaaggcgag catgcccgac
7381 ggcgaggatc tctgtgtgac ccatggcgat gcctgcttgc cgaatatcat ggtggaaaa
7441 ggcgctttt ctggattcat cgactgtggc cggctgggtg tggcggaccg ctatcaggac
7501 atagcgttgg ctacccgtga tattgtgtaa gagcttggcg gcgaatgggc tgaccgcttc
7561 ctgctgcttt acggtatcgc cgtcccgat tgcgagcgca tgccttcta tgccttctt
7621 gacagttct tctgaatttt gttaaaatt ttgttaaato agctcaattt ttaaccaata
7681 ggcgaaaato ggcaacatcc cttataaatc aaagaatag acccgatag ggttgagtg
7741 tgttcagatt tgaacaaga gtccactatt aaagaactg gactccaacg tcaaagggcg
7801 aaaaaccgct tatcagttgc atggccact acgtgaacca tcaaccaaat caagttttt
7861 gcggtcaggg tgcgtaaac ctctaaatcg gaaccctaaa gggagccccc gatttagagc
7921 ttgacgggga aagcggcga acgtggcgag aaaggaagg aagaagcga aaggagcggg
7981 cgtagggcg ctggcaagt tagcggtcac gctgcgcgta accccaacac ccgcccgtt
8041 aatgcgcccg tacagggcgc gtccattcgc cattcaggat cgaatattt cttaattaa
8101 atcatcaata atatacctt

//

1 ttttgattgaagccaatatgataatgaggggtggagtttggtagctggcggggcgct 60
AAACCTAACTTCGGTTACTATTACTCCCCACCTCAAACACTGCACCGCCCCCGCA

61 gggaaacggggcggtgacgtagtagtggcggaaagtgtgtagttgcaagtgtggcgaa 120
CCCTTGCCCCGCCACTGCATCATCACCCGCTTCACACTACAACGTTACACCGCCTT

Encap other (162, 310) >>>

121 cacatgtaagcgagtagtggaacaaagtacgtttttggtgtgcgcccgtgtacacag 180
GTGTACATTCGCTGCCCTACACCGTTTTCACTGCAAAAACACACGCGGCCACATGTGCC

181 aagtgacaattttcgcggttttagcggatggttagtaaaattggcgtaaccagat 240
TTCACGTATAAAGCGCCAAAATCCGCTTACAACATCATTTAAACCCGCATTGGCTCA

241 aagatttggccattttcgcgggaaaaactgaataagaggaagtgaatctgaaatattt 300
TTCTAAACCGGTAAGCGCCCTTTGACTTATTCCTCTCACTTTAGACTTATTAAC

301 tgttactcatagcgcgtaatacggcagacctcagcgtagattattgaagcatttatcag 360
ACAATGAGTATCGGCATTATGCCGCTGGAGTCGCGATCTAATAACTTCGTAATAAGTC

amp prom (365, 393) <<<

361 ggttattgtctcatgagcgggatacatatttgaatgtatttagaaaaataaacaatagg 420
CCAATAACAGAGTACTCGCCTATGTATAAACTTACATAAATCTTTTATTGTTTATCCC

HpaI

421 gttccgcgcacatttcccgaagtgccacctgacgttaactataacggtcctaaggta 480
CAAGCGCGTGTAAAGGGGCTTTCACGGTGGACTGCAATTGATATTGCCAGGATTCAT

481 gcgaaagctcagatctggatctcccgatcccctatggtcgaactctcagtaaatctgctc 540
CGCTTTCGAGTCTAGACCTAGAGGGCTAGGGGATACCAGCTGAGAGTCATGTTAGACGAG

541 tgatgccgcatagtttaagccagtatctgctcccctgcttgggtggtggaggtcgtgagta 600
ACTACGGCGTATCAATTCCGTCATAGACGAGGGACGAACACACAACCTCCAGCGACTCAT

601 gtgcgagcaaaaatttaagctacaacaaggaagcgttgaccgacaattaatgtagtct 660
CACGCGCTCGTTTTAAATTCGATGTTGTTCCGTTCCGAACCTGGCTGTTAATTACATCAGA

5' -LTR (669, 1151) >>>

661 tatgcaatactctttagtcttgcacatggttaacgatgtagcaacatgccttaca 720
ATACGTTATGAGAACATCAGAACGTTGTACCATTTGCTACTCAATCGTTGTACGGAATGTT

721 ggagagaaaaagcaccgtgcatgcccattggtggaagtaaggtgtacgatcgtgcctta 780
 CCTCTCTTTTCGTGGCAGTACGGCTAACCACTTCATTCACCCATGCTAGCACGGAAT

781 tttaggaaggcaacagacgggtctgacatggattggacgaaccactgaattgccgattgc 840
 AATCCTTCCGTTGCTGCCAGACTGTACCTAACCTGCTTGGTGACTTAACGGCGTAACG

HIV-1_5_LTR other (880,1060)>>>
 |

841 agagatatgtatttaagtcctagctcgatacataaacgggtctctctggttagaccag 900
 TCTCTATAACATAAATTCACGGATCGAGCTATGTATTTGCCAGAGAGACCAATCGTTC

901 atctgagcctgggagctctctggctaaactagggaaaccactgottaagcctcaataaagc 960
 TAGACTCGGACCCTCGAGAGACCGATTGATCCCTTGGGTGACGAATTCGGAGTTATTTCC

961 ttgccttgagtcttcaagtagtgtgtgcccgtctgtgtgtgactctggttaactagaga 1020
 AACGGAATCAGCAAGTTCATCACACACGGGCAGACACACTGAGACCATTGATCTCT

1021 tcctcagacccttttagtcagtggtgaaaatctctagcagtgccgcccgaacagggaact 1080
 AGGGAGTCTGGGAAAATCAGTCACACCTTTTAGAGATCGTCACCGGGGCTTGTCCCTGA

1081 tgaagcgaaagggaaaccagaggagctctctcagcagaggactcgtgctgagccgaacgact 1140
 ACTTTCGCTTCCCTTTGGTCTCCTCGAGAGAGCTGCGTCTGAGCCGAACGACTTCGCG

HIV-1_psi_pack other (1171,1215)>>>
 |

1141 gcacggcaagagggcagggggcgactggtgagtagcggcaaaaattttgactagcggag 1200
 CGTGGCGTTCCTCCCTCCCGCCGCTGACCACTCATGCGGTTTTTAAACTGATCGCTC

1201 gctagaaggagagagatgggtgagagagcgtcagtagtaaaagcggggagaattagatcgc 1260
 CGATCTTCTCTCTACCCACGCTCTCGCAGTCATAATTCGCCCCCTTTAATCTAGCG

NruI
 |

1261 gatgggaaaaaattcgggtaaggccagggggaaagaaaaataaaataaaacatatag 1320
 CTACCCCTTTTTAAGCAATTCGGTCCCTTTCTTTTTTATATTTAATTTTGTATATC

1321 tatgggcaagcagggagctagaacgattcgcagttaatcctggcctgttagaacaatcag 1380
 ATACCCGTTCTGCTCCCTCGATCTTGTAGCGTCAATTAGGACCGGACAATCTTTGTATC

1381 aaggctgtagacaaatacagggacagctacaaccatcccttcagacaggatcagaagaac 1440
 TTCCGACATCTGTTTATGACCCTGTCGATGTTGGTAGGGAAGTCTGCTTCTAGCTTCTTG

1441 ttgatcattatataacagtagcaacctctattgtgtgcoataaagatagagataa 1500
 AATCTAGTAATATATATATGTCATCGTTGGGAGATAACACAGTAGTTTCTTCTCTATT

1501 aagacaccaaggaagccttagacaagatagaggaagagcaaaacaaaagtaagaccaccg 1560
 TTCTGTGGTTCCTTCGAAATCTGTCTATCTCCTTCTCGTTTTGTTTCAATCTGGTGGC

1561 cacagcaagcgcgctgatcttcagacctggaggagagatatgagggacaattgagaag 1620
 GTGTCGTTCCGGCGGACTAGAAGTCTGGACCTCCTCCTTATACTCCCTGTTAACTCTTC

1621 tgaattataataataaagtagtaaaaattgaaccatttagagtagcaccaccaaggc 1680
 ACTTAATATATTTATATTTTCATCATTTTTAACTTGGTAATCCTCATCGTGGGTGGTTCCG

RRE reg (1723,1956)>>>
 |

1681 aaagagaagagtggtgcagagagaaaaagagcagtgggaaataggagctttgttccttgg 1740
 TTCTCTTCTCACCACGCTCTCTTTTTTCTCGTCACCCTTATCCTCGAAACAGGAACC

ORF_2 rf (2) (1766,2449)>>>
 |

1741 gttcttgggagcagcaggaagcactatgggagcagcgtcaatgacgctgacggtacagcg 1800
 CAAGAACCTCGTCTGCTTCTCGTATACCCGCTCGCAGTTACTGCGACTGCCATGTCCG

1801 cagacaattattgtctgtatagtgacgagcagaacaattgtgtagggctattgagcg 1860
 GTCTGTTAATAACAGACCATATCACGTCGTCGCTTGTAAACGACTCCCGATAACTCCG

1861 gcaacagcactctgtgcaactcacagctctggggcatcaagcagctccaggaagaatcct 1920
 CGTTGTCTGAGACACGTTGAGTGTGAGCCCGTAGTTCGTCGAGGTCCTGTTCTTAGGA

1921 ggctgtggaagatacctaaaggaatcaacagctcctggggatttgggggtgctctggaaa 1980
 CCGACACCTTCTATGGATTCTAGTTGTGAGGAGCCCTAAACCCCAACGAGACCTTT

1981 actcatttgcaccactgctgtgccttggaaatgctagttggagtaataatctctggaaca 2040
 TGAGTAAACGTTGGTACGACACCGAACCTTACGATCAACCTCATTATTTAGAGACCTTGT

2041 gatttggaaatcacagcactggatggagtgaggagagaaattaacaattacacaagcct 2100
 CTAAACCTTAGTGTCTGGACCTACCTCACCTGCTCTTAAATGTTAATGTGTTTCGAA

2101 aatacactccttaattgaagaaatcgaaaaccagcaagaaagaatgaacaagaattatt 2160
 TTATGTGAGGAATTAACCTTCTAGCGTTTTGTGCTCTTTCTTACTTGTCTTAATAA

2161 ggaattagataaatgggcaagtttggaaattggtttaacatacaaaattggctgtggtta 2220
 CCTAATCTATTTACCGTTCAAACACCTTAACCAATTTGATTTGTTAACCACACCAT

2221 tataaaattattcataatgtagtaggagccttggtaggtttaagaatggttttctgtgt 2280
 ATATTTAATAAGTATTACTATCATCTCCGAACCATCCAAATCTTATCAAAAACGACA

2281 actttctatagtgaaatagagtttaggcaggatattaccattatogtttccagaccacct 2340
 TGAAGATATCACTTATCTCAATCCGTCCTTATAAGTGGTAATAGCAAAGCTGGGTGGA

2341 cccaacccccgaggggaccgacagggcccgaaggaatagaagaagaaggtggagagagaga 2400

GGGTTGGGGTCCCTGGGCTGTCCGGCTTCCCTTATCTTCTTCCACCTCTCTCTCT

CMV (2450,3020)>>>

2401 cagagacagatccattcagattagtgaaacggatctcgacggatcgataagcttgggagtt 2460
GTCTCTGTCTAGGTAAGCTAATCACTTGCCCTAGAGCTGCCATAGCTATTCGAACCTCAA

2461 ccgcgttacataacttacggtaaatggccccctggctgacggcccaacgacccccggcc 2520
GGCGCAATGTATGAATGCCATTACCGGGCGGACCGACTGGCGGGTGTCTGGGGCGGG

2521 attgacgtcaataatgacgtatgttcccatagtaaacgcaatagggactttccattgacg 2580
TAACTGCAGTTACTACTGCATACAAGGTATCATTGCGGTTATCCCTGAAAGGTAACCTGC

NdeI

2581 tcaatgggtggagatatttacggtaaacgcccacttggcagtacatcaagtgtatcatat 2640
AGTTACCCACCTCATAAATGCCATTTGACGGGTGAACCGTCATGTAGTTCACATAGTATA

2641 gccaaagtcgccccctattgacgtcaatgacggtaaatggccccctggcattatgcccc 2700
CGGTTTCATGCGGGGATAACTGCAGTTACTGCCATTTACCGGGCGGACCGTAATACGGGT

2701 gtacatgaccttattgggactttctacttggcagttacatctacgtattagtcacgctat 2760
CATGTACTGGAATACCTGAAAGGATGAACCGTCATGTAGATGCATAAATCAGTAGCGATA

2761 taccatgggtgatgcggttttggcagttacatcaatggcggtgtagcggtttgactcacg 2820
ATGGTACCACCTAGCCAAAACCGTCATGTAGTACCGGCACCTATCGCCAACTGAGTGC

2821 gggattccaagtctccacccattgacgtcaatgggagttgttttggcaccacaaatca 2880
CCCTAAAGGTTACAGAGTGGGGTAACTGCAGTTACCTCAACAAAACCGTGGTTTTAGT

CMV prom (2911,2992)>>>

2881 acgggactttccaaaatgtcgtaacaactccgccccattgacgcaaatggggcgttaggcg 2940
TGCCCTGAAAGGTTTACAGCATTGTTGAGGCGGGTAACTGCGTTTACCCGCCATCCGC

2941 tgtacggtgggaggtctatataaagcagagctcgttttagtgaaccgtcagatcgccctgg 3000
ACATGCCACCTCCAGATATATTCGCTCGAGCAAATCACTTGGCAGCTAGCGGACCTC

3001 acgcccacacgctgttttgacctccatagaagacaccggctagcgtttaaacttaagct 3060
TGCGGTAGGTGCGACAAAACCTGGAGGTATCTTCTGTGGCCGATCGCAAATTTGAATTCGA

XhoI

KpnI ApaI XbaI NotI

3061 tggtaacctcgagcctagggggccagtaacttctagaccgggactagtcggcgcgctgg 3120
ACCATGGGAGCTCGGATCCCCGGGTCATGAAGATCTGGCGCCTGATCAGCCGGCGACC

HA (3130,3160)>>>

BamHI EcoRI SV40ER reg (3167,3403)<<<

3121 atccgaattctaccatacagcgtcccagactacgcttgatccccggctgtggaatgtgt 3180
TAGGCTTAAGATGGGTATGCTGCAGGGTCTGATGCGAACTAGGGGCCGACACCTTACACA

SV40 prom (3190,3458)>>>

3181 gtcagttagggtgtggaagtccccaggctccccagcaggcagaagtatgcaaaagcatgc 3240
CAGTCAATCCACACCTTTCAGGGTCCGAGGGTTCGTCGGCTTTCATACGTTTCGTACG

3241 atctcaattagtcagcaaccagggtgtggaagtccccaggctccccagcaggcagaagta 3300
TAGAGTTAATCAGTCGTTGGTCCACACCTTTCAGGGTCCGAGGGTTCGTCGGTTCAT

SV40 origin (3357,3434)>>>

3301 tgcaaaagcatgcatctcaattagtcagcaaccatagtcggccccctaactccgcccaccc 3360
ACGTTTCGTACGTAGAGTTAATCAGTCGTTGGTATCAGGGCGGGATTGAGGCGGGTAGG

3361 cgcacctaaactccgcccagttccgcccattctccgcccattggtgactaatttttttta 3420
CGGGGATTGAGGCGGGTCAAGCGGGTAAAGAGCGGGTACCAGCTGATTAATAAATAAT

SfiI

3421 tttatgcagagccgagggccgctcggcctctgagctattccagaagttagtgaggagct 3480
AAATACGTCTCCGGCTCCGGCGGAGCCGAGACTCGATAAGGTCTTCATCACTCTCCGA

StuI

3481 tttttggggcctagtgaccagatcctaatgctgctagttttgcaaaaagcttgggctgc 3540
AAAAACCTCCGGATCACTGGTCTAGATTACGCACGATCAAACGTTTTTCGAACCCGACG

ORF_3 rf (2) (3587,4381)>>>

Neo/Kan (3584,4379)>>>

3541 aggtcagggcggatctgatcaagagacaggatgaggatcgttttcgcatgattgaaacaaga 3600
TCCAGCTCCGCCTAGACTAGTCTCTGTCTACTCTTAGCAAAGCGTACTAACTTGTCT

3601 tggattgcacgcaggttctccggccgcttgggtggagaggetattccgctatgactgggc 3660
ACCTAACGTGCGTCCAAAGAGCCGGCGAACCACCTCTCCGATAAGCCGATACTGACCCG

3661 acaacagacaatcggctgctctgatgcccggctgttccggctgtoagcgcagggggcggcc 3720

TGTTGTCTGTTAGCCGACGAGACTACGGCGGCACAAGCCGACAGTCGCGTCCCCGCGG

3721 ggttctttttgtcaagacgacctgtccgggtccctgaaatgaactgcaggacgagcagc 3780
CCAAGAAAACAGTTCTGGCTGGACAGGCCACGGACTTACTTTGACGTCTGCTCCGTCG

3781 gcggctatcgtggctggccacgacggcggttccttgcgcagctgtgctogaactgttcac 3840
CGCCGATAGCACCCGACCGGTGCTGCCGCAAGGACCGCTCGACACGAGCTGCAACAGTG

3841 tgaagcgggaagggactggctgtctattggcggaagtgcgggggaggatctcctgtcatc 3900
ACTTCGCCCTCCCTGACCGACGATAACCCGCTTACGGCCCGTCTTAGAGGACAGTAG

3901 tcacctgtctcgcogagaaagtaaccatcatggctgatgcaatgcggcggtgcatc 3960
AGTGGAACGAGGACGGCTCTTTCATAGGTAGTACCGACTACGTTACGCCCGCAGCTATG

3961 gcttgatccggctacctgcccattcgaccaccaagcgaacatcgcatcgagcgagcagc 4020
CGAACTAGGCCGATGGACGGTAAGCTGGTGGTTCGCTTTGTAGCGTAGCTCGCTCGTGC

4021 tactcggatggaagccggctcttgcgacagcatgatctggacgaagagcatcaggggct 4080
ATGAGCCTACCTTCGGCCAGAACAGCTAGTCTACTAGACCTGCTTCTCGTAGTCCCCGA

4081 cgcgccagcogaactgttcgaccagctcaaggcgcgcatgcccagcggcaggatctcgt 4140
GCGCGTCCGGCTTGACAAGCGGTCCGAGTTCGCGCGTACGGGCTGCCGCTCCTAGAGCA

4141 cgtgaccatggcgatgcctgcttgcgcaatatcattggtggaatggcgcgttttctgg 4200
GCACTGGGTACCGCTACGGACGAAACGGCTTATAGTACCACCTTTTACCGCGAAAAGACC

4201 attcatgactgtggccggctgggtgtggcggaccgctatcaggacatagcgttggctac 4260
TAAGTAGCTGACACCGCCGACCCACACCGCTGGCGATAGTCTGTATCGCAACCGATG

4261 ccgtgatattgtgaaagacttggcggcgaatgggctgaccgcttctcgtgctttacgg 4320
GGCACTATAACGACTTCTCGAACCGCGCTTACCGACTGGCGAAGGACACGAAATGCC

4321 tategcgcgtcccgattcgcagcgcacatgccttctatgccttcttgcaggttctctg 4380
ATAGCGCGAGGGCTAAGCGTCCGCTAGCGGAAGATAGCGGAAGACTGCTCAAGAAGAC

EcoRV
|

4381 agcgggactctgggttcgatacttagcaccagatctaatgcgtgctagaaggcagctg 4440
TCGCCCTGAGACCCCAAGCTATAGATCGCTGGTCTAGATTACGCACGATCTCCGTCGAC

delta_U3 other (4477, 4529) >>>

4441 tagatctagccactttttaaagaaaagggggactggaagggttaattcactccaac 4500
ATCTAGAAATCGGTGAAAAATTTCTTTTCCCGCTGACCTTCCGATTAAGTGAGGGTTG

3'-LTR (4500, 4790) >>>

4501 gaagacaagatctgcttttgcgtgactgggtctctctggtctagcaccagatctaat 4560
CTTCTGTCTAGACGAAAAACGAACATGACCCAGAGAGACCAGATCGCTGGTCTAGATTA

4561 gcgtgctaggagcctgggagctctctggttaactaggaaccactgcttaagcctcaat 4620
CGCAGATCCTCGGACCTCGAGAGACCAGATTGATCCCTGGGTGACGAATTCGGAGTTA

4621 aaagcttgccttgagtctcaagtagtggtgcccgtctgtgtgactctggtaact 4680
TTTCGAACGGAACTCAGAACTTCATCACACCGGGCAGACAACACTGAGACCATTTGA

4681 agagatccctcagacccttttagtcagtggtgaaaatctctagcagtagtgcagtc 4740
TCTCTAGGGAGTCTGGGAAAATCAGTCACACCTTTTAGAGATCGTCATCATCAAGTACAG

4741 atcttatttccagctatttaaacctgcaagaaatgaataatcagagagtgagaggaact 4800
TAGAATAATAAGTCATAAATATGAACGTTCTTTACTTATAGTCTCTCACTCTCTCTGA

4801 tggcctgaccagatctaatgcgtaggcgtttaaaccgctgacgcctcctgactgtgcc 4860
ACCCGACTGGTCTAGATTACGCATCCGGCAAAATTTGGCGACTAGTCGGAGCTGACACGG

SmaI
|
XmaI
| |

4861 ttctagttgccagcactgtgtgtgcccggcgcgatcgtgcccctcccctgctcct 4920
AAGATCAACGGTCGGTAGACAACAACGGCCCGCGCTAGCGACGGGGAGGGGACCGGAA

4921 ccttgaccctggaaggtgccactcccactgtccttcttaataaaatgaggaattgcat 4980
GGAACCTGGGACTTCCACGGTGGGTGACAGGAAAGGATTTATTTACTCTTAACTGTA

4981 cgcattgtctgagtaggtgctattctattctgggggtggggggggcaggacagcaag 5040
GCGTAACAGACTCATCCACAGTAAGATAAGACCCCCACCCACCCCGTCTGCTGTTCC

5041 gggaggattgggaagacaatagcaggcatgctggggatgctgggtgggtctatgctctg 5100
CCTCCTAACCTTCTGTTATCGTCCGTACGACCCCTACGCCACCCGAGATACGAAGAC

5101 agcgggaaagaaccagcagatcgatctgcatctatgtcgggtgaggagaaagaggtaatg 5160
TCCGCCTTCTTGGTCTGCTAGCTAGACGTAGATACAGCCACGCCTCTTCTCCATTAC

5161 aaatggcattatgggtattatgggtctgcattaatgaatcgccaacgacccgggtgta 5220
TTTACCGTAATACCCATAATACCCAGACGTAATACTTAGCCGTTGCTAGGGCCACACT

5221 aataccgcacagatgogtaaggagaaaaataccgcatcaggcctcttccgctctcctcgt 5280
TTATGGCGTGTCTACGCATTCCTTTTTATGGCGTAGTCCGCGAGAAGGCGAAGGAGCGA

5281 cactgactcgtgcctcgtctcgttcggctgcccggcagcgtatcagctcaactaaaggc 5340
GTGACTGAGCGACGCGACGCAAGCCGACCGCGCTCGCCATAGTCGAGTGAGTTCCG

5341 ggtaatacggttatccacagaaatcaggggataacgcaggaagaacatgtgagcaaaagg 5400
 CCATTATGCCAATAGGTGCTTAGTCCCTATTGCGTCCCTTTCTGTACTCGTTTTCC

pBR322 origin (5431, 6050) <<<
 |

5401 ccagcaaaaggccaggaaccgtaaaaaggccgcttgcggttttccataggctccg 5460
 GGTCTTTTTCCGGTCTTGGCATTTTTCCGGCGCAACGACCGCAAAAAGGTATCCGAGGC

5461 cccccctgacgagcatcacaataatcgacgctcaagtcagagtggtgcaaacccgacagg 5520
 GGGGGGACTGCTCGTAGTGTTTTAGCTGCGAGTTCAGTCTCCACCGCTTTGGGCTGTCC

5521 actataagataaccaggcgtttccccctggaagctccctcgtgctcctcctgtttccgac 5580
 TGATATTTCTATGGTCCGCAAAAGGGGACCTTCGAGGGAGCACCGGAGAGGACAAGGCTG

5581 cctgcccgtttaccggatacctgtccgcctttctcccttcgggaagcgtggcgctttctca 5640
 GGACGGCGAATGGCCTATGGACAGGCGGAAAGAGGAAGCCCTTCGCACCGCAAGAGAT

5641 tagctcacgctgtaggtatctcagttcgggtgtaggtcgttccgctccaagctgggctgtg 5700
 ATCGAGTGCACATCCATAGAGTCAAGCCACATCCAGCAAGCGAGGTTCGACCCGACACA

5701 gcaagaacccccggttcagccgacccgctgcgcttaccggtaactatcgtctttagtc 5760
 CGTCTTTGGGGGCAAGTCGGGCTGCGAGCGCGAATAGGCCATTGATAGCAGAAGTACG

5761 caaccgggtaagacagacttaccgcaactggcagcagccactggtaacaggattagcag 5820
 GTTGGGCCATTTCTGTCTGAATAGCGGTGACCGTCTGCGTGACCATTTCTAATCGTC

5821 agcaggtatgtaggcgtgtacagagttcttgaagtggtggcctaactacggctacac 5880
 TCGCTCCATACATCCGCCAGATGTCTCAAGAACTTACCACCGGATTGATGCCGATGTG

5881 tagaaggacagttattggtatctgcgctcgtgtaagccagttaccttcggaaaaagagt 5940
 ATCTTCTGTATATAAACCATAGACGCGAGACGACTTCGGTCAATGGAAGCCTTTTCTCA

5941 tggtagctcttgatccggcaaaacaccaccgctggtagcgggtgttttttggtttgcaa 6000
 ACCATCGAGAACTAGGCCGTTTGTGTTGGTGGCGACCATCGCCACCAAAAAACAAACGTT

6001 gcagcagattacgcgcagaaaaaagatctcaagaagatcctttgatctttctacggg 6060
 CGTCTTAATGCGCGTCTTTTTTCTTAGAGTCTTCTAGAACTAGAAAAGATGCC

6061 gtctgacgctcagtggaacgaaaactcagcttaaggttttggctcatgagattatcaaa 6120
 CAGACTGCGAGTCACTTGTCTTTGAGTGAATTCCTTAAACCAGTACTCTAATAGTTT

6121 aaggatcttccactagatccttttaataaaaatgaagttttaaatacaatctaaagtat 6180
 TTCTTAGAAGTGGATCTAGGAAAATTAATTTTTACTTCAAAATTTAGTTAGATTTTATA

6181 atatgagtaaaacttgctcagagttaccaatgcttaatacagtgaggcacctatctcagc 6240
 TATACTCATTTGAACCAGACTGTCAATGGTTACGAATTAGTCACTCCGTGGATAGAGTCCG

6241 gatctgtctatttcgctcactcagttgctgactcccgctcgtgtagataactacgat 6300
 CTAGACAGATAAAGCAAGTAGGTATCAACGGACTGAGGGGCAGCACATCTATTGATGCTA

6301 acgggagggcctaccatctggcccagtgctgcaatgataccgagagaccacgctcacc 6360
 TGCCCTCCGAATGGTAGACCGGGTCACGACGTTACTATGGCGCTCTGGGTGCGAGTGG

6361 ggctccagattatcagcaataaacagccagccggaaggccgagcgcagaagtggtcc 6420
 CCGAGGTCTAATAGTCTGTTATTTGGTCTGGTCCGCTTCCCGGCTCGCGTCTTACCAGG

6421 tgcaactttatccgctccatccagctctataaattgttgcgggaagcagtagagtaagtag 6480
 ACGTTGAAATAGGCGGAGGTAGTTCAGATAAATTAACAACGGCCCTTCGATCTCATTCATC

6481 ttcgcaagttatagtttgcgcaactgttggaaaaagatcttccactagatccttttc 6540
 AAGCGTCAATATCAACCGGTTGCAACAACCTTTTTCTAGAAAGTGGATCTAGGAAAAG

6541 acgtagaagccagtcocgcagaaacggtgctgaccccgatgaatgtoagctactgggct 6600
 TGCATCTTTCGGTACGGCTCTTGGCCAGACTGGGGCTACTTACAGTCGATGACCCGA

6601 atctggacaagggaaaacgcaagcgaagagaaagcaggttagcttgcagtggtttaca 6660
 TAGACCTGTTCCCTTTGCGTTCGCGTTCTCTTTCGTCATCGAACGTCACCCGAATGT

NEOKAN prom (6703, 6752) >>>
 |

6661 tggcagtagctagactggcgggttttatggacagcaagcgaaccggaattgccagctggg 6720
 ACCGCTATCGATCTGACCCGCCAAAATACCTGCTGCTTCGCTTGGCCTAACGGTGCAGCC

6721 gcgcccctctggttaaggttgggaagccctgcaaaagtaaaactggatggctttctcgcgcca 6780
 CGGGGAGACCATCCAACCTTCGGGACGTTTCATTTGACCTACCAGAAAGAGCGGGCT

6781 aggatctgtagcgcaggggatcaagctctgatcaagagacaggttaggatcgtttcgc 6840
 TCCTAGACTACCGCTCCCTAGTTCGAGACTAGTCTCTGTCTACTCTAGCAAAGCG

ORF_1 rf (1) (6841, 7635) >>>
 |

6841 atgattgaacaagatggattgcacgcaggttctccggccgcttgggtggagaggtattc 6900
 TACTAARTTGTCTACTTAACGTGCGTCCAAGAGGCCGGCAACCCACTCTCCGATAAG

6901 ggctatgactgggcaacaacagacaatcggtcgtctgatgcccgcgcttcccggtgtca 6960
 CCGATACTGACCCGTGTTGTTCTGTTAGCCGACGAGACTACGGCGGCACAAGCCGACAGT

6961 gcgagggggcccggttcttttgcgcaagcagcctgctcgggtccctgaaatgaaactg 7020
 CGCGTCCCGGGGCAAGAAAAACAGTTCTGGCTGGACAGGCCACGGGACTTACTTGCAC

7021 caagacgagcagcgggctatcgtggctggccacgacgggcttcccttgcgagctgtg 7080

GTTCTGCTCCGTCGCGCCGATAGCACCGACCGGTGCTGCCCGCAAGGAACGCGTCGACAC
 7081 ctcgacgttgctcactgaagcgggaaggactggtgcttattgggogaagtgcggggcag 7140
 GAGCTGCAACAGTACTTCGCCCTTCCCTGACCGACGATAAACCCGCTTACGGCCCGCTC
 7141 gatctcctgtcactcactccttgcctcctgcccagagaagtatccatcattggctgatgcaatg 7200
 CTAGAGGACAGTAGAGTGGAACGAGGACGGCTCTTTTCATAGGTAGTACCGACTACGTTAC
 7201 cggcggctgcatacgttgcctgacccgctacccattgaccaccaagcgaacaatcgc 7260
 GCCGCCGACGTATGCGAACTAGGCCGATGGACGGGTAAGCTGGTGGTTCGCTTTGTAGCG
 7261 atcgagcagcaactgactcggatggaagccggtcttctgatcaggatgatctggagcaa 7320
 TAGCTCGCTCGTGCATGAGCCTACCTTCGGCCAGAACAGCTAGTCTACTAGACCTGCTT
 7321 gagcatcagggctcgcgccagccgaactgttcgccaggctcaaggcagcatgcccgcac 7380
 CTCGTAGTCCCGAGCGCGGTCCGCTTGACAAGCGGTCCGAGTTCGCTCGTACGGGGTG
 7381 ggcgaggatctcgtcgtgacctatggcgtgctcgtgcttgcgaatatcattggtgaaaaat 7440
 CCGCTCTAGAGCAGCACTGGGTACCGCTACGGCAGAACGGCTTATAGTACCACCTTTTA
 7441 ggcgcttttctggattcactgactgtggcggctgggtgtggcggaccgctatcaggac 7500
 CCGCGAAAAGACCTAAGTAGCTGACACCGGCCGACCCACACCGCTGGCGATAGTCTCTG
 7501 atagcgttggtaccctgatattgctgaagagcttggcggcgaatggcgtgaccgcttc 7560
 TATCGCAACCGATGGGCACTATAACGACTTCTCGAACCGCGCTTACCGACTGGCGAAG
 7561 ctgctgcttacggtatcgcgcgtcccgattccgagcgcacgctctctatcgcctctct 7620
 GAGCACGAAATGCCATAGCGGCGAGGGCTAAGCGTTCGCGTAGCGGAAGATAGCGGAAGAA
 7621 gacgagttctctgaaatttgttaaaatttgttaaatcagctcattttttaaccaata 7680
 CTGCTCAAGAGACTTAAACAATTTTAAAAACAATTTAGTCGAGTAAAAAATGGTTAT
 7681 ggcgaaatcggcaacatoccttataaatcaaaagaatagaccgcataggggttagtgt 7740
 CCGCTTTAGCCGTTGTAGGGAATATTTAGTTTTCTTATCTGGCGCTATCCCAACTCACA
 f1 origin (7740,8045)<<<
 |
 7741 tgtccagtttgaacaagagtcactattaaagaacgtggactccaacgtcaaggcgg 7800
 ACAAGGTCAAACCTTGTTCTCAGGTGATAATTTCTTGCACCTGAGGTTGCAGTTTCCCGC
 7801 aaaaaccgtctatcagggcgtgcccactcgtgaaccatcaccacaaatcaagttttt 7860
 TTTTGGCAGATAGTCCCGCTACCGGGTGTGCACTTGGTAGTGGGTTTAGTTCAAAAAA
 7861 gggctcaggtgcgtaagctctaaatcggaaccctaaagggagccccgatttagagc 7920
 CGCCAGCTCCACGGCATTTCGAGATTAGCTTGGGATTTCCCTCGGGGGCTAAATCTCG
 7921 ttgacgggaaagcggcgaactggtgcgagaaaggaagggaagaaagcgaaggagcggg 7980
 AACTGCCCTTTTCGGCCGCTTGACCGCTCTTCTTCCCTTCTTTCGCTTTCCTCGCCC
 7981 cgtagggcgtggcaagtgtagcggtcacgctgcgctgaaccaccaccccgcgcgctt 8040
 GCGATCCCAGCGACCGTTTACATCGCCAGTGCACGCGCATTTGGTGGTGTGGGCGCGGAA
 8041 aatgcgcccctacagggcgcgtccattgcccattcaggatcgaattaattcctaattaac 8100
 TTACCGCGGATGTCGCCGCGAGTAAAGCGGTAAGTCTTAGCTTAATTAAGAATTAATTG
 8101 atcatcaataatatacctt 8119
 TAGTAGTTATATATGGAA

5'-LTR
 Start: 670 End: 1151
 CMV Promoter
 Start: 2451 End: 3020
 Neomycin
 Start: 3635 End: 4429
 3'-LTR
 Start: 4551 End: 4840