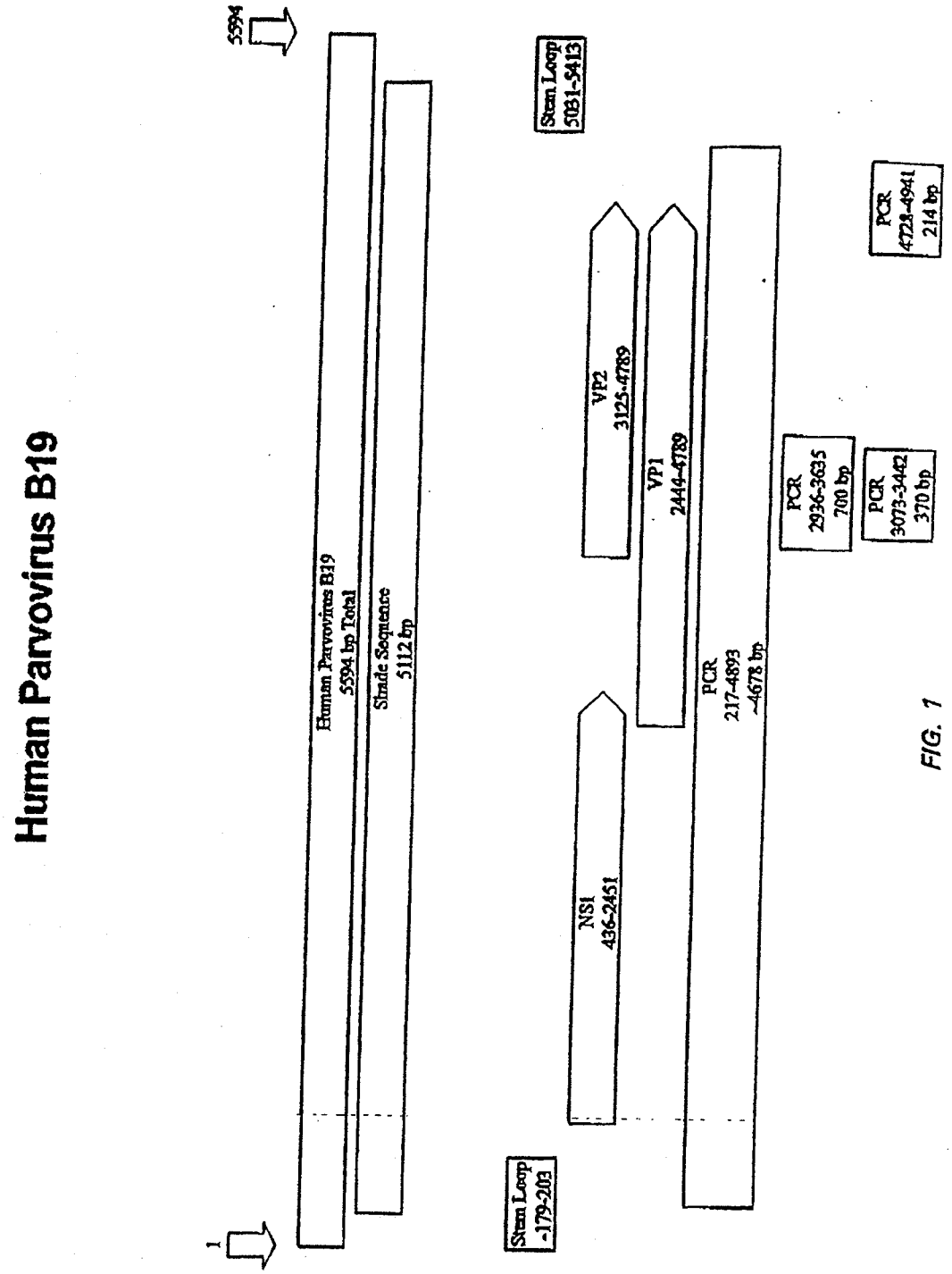

Human Parvovirus B19
5594
1
Human Parvovirus B19
5594 bp Total
Shade Sequence
5112 bp
Stem Loop
5081-5413
Stem Loop
-179-203
VP2
3125-4789
VP1
2444-4789
NS1
436-2451
PCR
217-4893
~4678 bp
PCR
2936-3635
700 bp
PCR
3073-3442
370 bp
PCR
4728-4941
214 bp

FIG. 1

CH47-26

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgttaaaagcatgtggagtgaggggccactttagtgccaact
ctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactc
aaccccatggagatatttagattttaatgctttaaatttgtttttttcacctttagagtttcagcatttaattgaaaact
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaactg
gaggggggagtacaagttactgacagcactaccgggcgcctatgcatgttagtagaccatgaatacaagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 2A

CH48-29

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaacaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggtggcagtaatcctgccaaaagcatgtggagtgaggggccactttactgccaact
ctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gctagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactca
actccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacctaattgaaaattat
ggaagtatagctcctgatgatttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaactgg
agggggggtacaggttactgacagcactacagggcgcctatgcctgttagtagaccatgaatacaagtacc
catatgtgttagggcaaggtcaggatactttag

FIG. 2B

CH33-2

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaacaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggtggcagtaatcctgccaaaagcatgtggagtgaggggccacttttactgccaact
ctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gctagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactca
actccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacctaattgaaaattat
ggaagtatagctcctgatgatttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaactgg
agggggggtacaggttactgacagcactacagggcgcctatgcttgttagtagaccatgaatacaagtacc
catatgtgttagggcaaggtcaggatactttag

FIG. 2C

CH33-3

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaacatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggtggcagtaatcctgccaaaagcatgtggagtgaggggccacttttactgccaact
ctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gctagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactca
actccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacctaattgaaaattat
ggaagtatagctcctgatgatttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaactgg
agggggggtacaggttactgacagcactacagggcgcctatgcctgttagtagaccatgaatacaagtacc
catatgtgttagggcaaggtcaggatactttag

FIG. 2D

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CH33-4

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggtggcagtaatcctgccaaaagcatgtggagtgaggggccactttactgccaact
ctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gctagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactca
actccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacctaattgaaaattat
ggaagtatagctcctgatgatttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaactgg
agggggggtacaggttactgacagcactacagggcgcctatgcctgttagtagaccatgaatacaagtacc
catatgtgttagggcaaggtcaggatactttag

FIG. 2E

CH42-7

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgtcaaaagcatgtggagtgaggggccactttagtgccaac
tctgtaacttgtacattttccaggcagtttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaact
ggaggggggtacaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatacaagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 2F

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CH42-18

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgtcaaaagcatgtggagtgaggggccacttttagtgccaac
tctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatacaagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 2G

CH42-19

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgtcaaaagcatgtggagtgaggggccacttttagtgccaac
tctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaact
ggaggggggtacaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatacaagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 2H

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CH46-23

attaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
ncacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgtcaaaagcatgtggagtgagggggccacttttagtgccaac
tctgtaacttgtacattttccaggcagtttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaact
ggagggggggtacaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatacaagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 2I

CH1-1

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgtcaaaagcatgtggagtgagggggccacttttagtgccaac
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agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaact
ggagggggggtacaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatacaagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 2J

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CH1-6

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgtcaaaagcatgtggagtgaggggccactttagtgccaac
tctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaact
ggaggggggtacaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatacaagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 2K

CH2-8

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccactttagtgccaac
tctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactc
aaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaatt
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaactg
gaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 2L

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CH2-10

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgagggggccacttttagtgccaac
tctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactc
aaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaatt
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacagaactg
gagggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 2M

H2-11C

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgagggggccacttttagtgccaac
tctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactc
aaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaatt
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaactg
gagggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 2N

CH5-13

ctaaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgttaaaagcatgtggagtgaggggccactttagtgccaact
ctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gcaagtagctgccacaatgccagtggaaaagaggcaaaggtttgcactattagtcccataatgggatactca
accccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaattat
ggcagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaactgg
agggggggtacaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatacaagtacc
caatgtgttagggcaaggtcaggatactttag

FIG. 2O

CH7-22

ataaatccatgtactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgttaaaagcatgtggagtgaggggccactttagtgccaact
ctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactc
aaccccatggagatatttagattttaatgctttaaatttgtttttttcacctttagagtttcagcatttaattgaaaact
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaactg
gaggggagtacaagttactgacagcactaccgggcgcctatgcatgttagtagaccatgaatacaagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 2P

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CH13-27

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaattctgtcaaaagcatgtggagtgaggggccacttttagtgctaact
ctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gcgagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccatcagtcccataatgggatactc
aaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaatt
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaactg
gagggggggtacaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatacaagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 2Q

CH14-33

ataaatccatatactcattggactgtggcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggagtaatcctgttaaaagcatgtggagtgaggggccacttttagtgccaactc
tgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccgcag
caagtagctgccacaatgccagtggaaaagaggcaaaggtttgcaccattagtcccataatgggatactcaa
ccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaattatg
gtagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaagatgttacagacaaaactggag
gggggtacaggttactgacagcactacagggcgcctatgcatgttagtggaccatgaatacaagtaccca
tatgtgttagggcaaggtcaggatactttag

FIG. 2R

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CH62-2

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcaattaattctgcagaagccagcact
ggtgcaggaggggggggcagtaatcctgtcaaaagcatgtggagtgagggggccacttttagtgccaact
ctgtaacttgtacaktttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gccagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactc
aaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaatt
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaactg
gagggggggtacaggttactgacagcactacaggccgcctatgcatgttagtagaccatgaatacaagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 2S

CH64-2

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgttaaaagcatgtggagtgagggggccacttttagtgccaact
ctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttcgcccgca
gcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactc
aaccccatggagatacttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaatt
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaactg
gagggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatacaagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 2T

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CH67-2

ataaatccatatactcattggactgtggcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggagtaatcctgttaaaagcatgtggagtgaggggccactttagtgccaact
ctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gcaagtagctgccacaatgccagtggaaaagaggcaaaggtttgcaccattagtcccataatgggatactc
aaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaatt
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaagatgttacagacaaaactg
gagggggggtacaggttactgacagcactacagggcgcctatgcatgttagtggaccatgaatacaagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 2U

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Parvovirus B19 clone #2-B1

```
   1 cccgccttat gcaaatgggc agccatctta agtgttttac tataatttta ttggtcagtt
  61 ttgtaacggt taaaatgggc ggagcgtagg caaggactac agtatatata gcacagcact
 121 gccgcagctc tttctttctg ggctgctttt ttcctggact tacttgctgt tttttgtgag
 181 ctaactaaca ggtatttata ctacttgtta acatactaac atggagctat ttagaggggt
 241 gcttcaagtt tcttctaatg ttctggactg tgctaacgat aactggtggt gctctttact
 301 ggatttagac acttctgact gggaaccact aactcatact aacagactaa tggcaatata
 361 cttaagcagt gtggcttcta agcttgactt tactgggggg ccactagcag ggtgcttgta
 421 ctttttttcaa gtagaatgta acaaatttga agaaggctat catattcatg tggttattgg
 481 ggggccaggg ttaaacccca gaaacctcac agtgtgtgta gaggggttat ttaataatgt
 541 actttatcac cttgtaactg aaaatctgaa gctaaaattt ttgccaggaa tgactacaaa
 601 aggcaaatac tttagagatg gagagcagtt tatagaaaac tatttaatga aaaaaatacc
 661 tttaaatgtt gtatggtgtg ttactaatat tgatggacat atagatacct gtatttctgc
 721 tacttttaga aagggagctt gccatgccaa gaaaccccgc atcaccacag ccataaatga
 781 tactagtact gatgctgggg agtctagcgg cacaggggca gaggttgtgc catttaatgg
 841 gaagggaact aaggctagca taaagtttca aactatggta aactggttgt gtgaaaacag
 901 agtgtttaca gaggataagt ggaaactagt tgactttaac cagtacactt tactaagcag
 961 tagtcacagt ggaagttttc aaattcaaag tgcactaaaa ctagcaattt ataaagcaac
1021 taatttagtg cctactagca catttttatt gcatacagac tttgagcaag ttatgtgtat
1081 taaaaacaat aaaattgtta aattgttact ttgtcaaaac tatgaccccc tattagtggg
1141 gcagcatgtg ttaaagtgga ttgataaaaa atgtggcaag aaaaacacac tgtggtttta
1201 tgggccgcca agtacaggga aaacaaactt ggcaatggcc attgctaaaa gtgttccagt
1261 atatggcatg gttaactgga ataatgaaaa ctttccattt aatgatgtag caggaaaaag
1321 cttggtggtc tgggatgaag gtattattaa gtctacaatt gtagaagctg caaaagccat
1381 tttaggcggg caacccacca gggtagatca aaaaatgcgt ggaagtgtag ctgtgcctgg
1441 agtacctgtg gttataacca gcaatggtga cattactttt gttgtaagcg ggaacactac
1501 aacaactgta catgctaaag ccttaaaaga gcgcatggta aagttaaact ttactgtaag
1561 atgcagccct gacatggggt tactaacaga ggctgatgta caacagtggc ttacatggtg
1621 taatgcacaa agctgggacc actatgaaaa ctgggcaata aactacactt ttgatttccc
1681 tggaattaat gcagatgccc tccacccaga cctccaaacc accccaattg tcacagacac
1741 cagtatcagc agcagtggtg gtgaaagctc tgaagaactc agtgaaagca gctttttaa
1801 cctcatcacc ccaggcgcct ggaacactga aaccccgcgc tctagtacgc ccatccccgg
1861 gaccagttca ggagaatcat ctgtcggaag cccagtttcc tccgaagttg tagctgcatc
1921 gtgggaagaa gccttctaca caccttggc agaccagttt cgtgaactgt tagttggggt
1981 tgattatgtg tgggacggtg taaggggttt acctgtctgt tgtgtgcaac atattaacaa
```

FIG. 3A

2041 tagtgggggа ggcttgggac tttgtcccca ttgcattaat gtaggggctt ggtataatgg
2101 atggaaattt cgagaattta ccccagattt ggtgcgatgt agctgccatg tgggagcttc
2161 taatcccttt tctgtgctaa cctgcaaaaa atgtgcttac ctgtctggat tgcaaagctt
2221 tgtagattat gagtaaagaa agtggcaaat ggtgggaaag tgatgataaa tttgctaaag
2281 ctgtgtatca gcaatttgtg gaattttatg aaaaggttac tggaacagac ttagagctta
2341 ttcaaatatt aaaagatcat tataatattt ctttagataa tcccctagaa aacccatcct
2401 ctttgtttga cttagttgct cgtattaaaa ataaccttaa aaactctcca gacttatata
2461 gtcatcattt tcaaagtcat ggacagttat ctgaccaccc ccatgcctta tcatccagta
2521 gcagtcatgc agaacctaga ggagaagatg cagtattatc tagtgaagac ttacacaagc
2581 ctgggcaagt tagcgtacaa ctacccggta ctaactatgt tgggcctggc aatgagctac
2641 aagctgggcc cccgcaaagt gctgttgaca gtgctgcaag gattcatgac tttaggtata
2701 gccaactggc taagttggga ataaatccat atactcattg gactgtagca gatgaagagc
2761 ttttaaaaaa tataaaaaat gaaactgggt ttcaagcaca agtagtaaaa gactacttta
2821 ctttaaaagg tgcagctgcc cctgtggccc attttcaagg aagtttgccg gaagttcccg
2881 cttacaacgc ctcagaaaaa tacccaagca tgacttcagt taattctgca gaagccagca
2941 ctggtgcagg aggggggggc agtaatcctg tgaaaagcat gtggagtgag ggggccactt
3001 ttagtgccaa ctctgtaact tgtacatttt ccagacaatt tttaattcca tatgacccag
3061 agcaccatta taaggtgttt tctcccgcag caagtagctg ccacaatgcc agtggaaagg
3121 aggcaaaggt ttgcaccatt agtcccataa tgggatactc aaccccatgg agatatttag
3181 attttaatgc tttaaattta ttttttcac ctttagagtt tcagcactta attgaaaatt
3241 atggaagtat agctcctgat gctttaactg taaccatatc agaaattgct gttaaggatg
3301 ttacggacaa aactggaggg ggggtgcagg ttactgacag cactacaggg cgcctatgca
3361 tgttagtaga ccatgaatat aagtacccat atgtgttagg gcaaggtcaa gatactttag
3421 ccccagaact tcctatttgg gtatacttte ccccтcaata cgcttactta acagtaggag
3481 atgttaacac acaaggaatt tctggagaca gcaaaaaatt ggcaagtgaa gaatcagcat
3541 tttatgtttt ggaacacagt tcttttcagc ttttaggtac aggaggtaca gcaactatgt
3601 cttataagtt tcctccagtg cccccagaaa atttagaggg ctgcagtcaa cacttttatg
3661 aaatgtacaa ccccttatac ggatcccgct taggggttcc tgacacatta ggaggtgacc
3721 caaaatttag atctttaaca catgaagacc atgcaattca gccccaaaac ttcatgccag
3781 ggccactagt aaactcagtg tctacaaagg agggagacag ctctagtact ggagctggaa
3841 aagccttaac aggccttagc acaggtacct ctcaaaacac tagaatatcc ttacgccctg
3901 ggccagtgtc tcagccgtac caccactggg acacagataa atatgtcaca ggaataaatg
3961 ccatttctca tggtcagacc acttatggta acgctgaaga caaagagtat cagcaaggag
4021 tgggtagatt tccaaatgaa aaagaacagc taaaacagtt acagggttta aacatgcaca
4081 cctactttcc caataaagga acccagcaat atacagatca aattgagcgc cccctaatgg
4141 tgggttctgt atggaacaga agagcccttc actatgaaag ccagctgtgg agtaaaattc
4201 caaatttaga tgacagtttt aaaactcagt ttgcagcctt aggaggatgg ggtttgcatc

FIG. 3B

4261 agccacctcc tcaaatattt ttaaaaatat taccacaaag tgggccaatt ggaggtatta
4321 aatcaatggg aattactacc ttagttcagt atgccgtggg aattatgaca gtaaccatga
4381 catttaaatt ggggcccccgt aaagctacgg gacggtggaa tcctcaacct ggagtgtatc
4441 ccccgcacgc agcaggtcat ttaccatatg tactatatga ccccacagct acagatgcaa
4501 aacaacacca cagacatgga tatgaaaagc ctgaagaatt gtggacagcc aaaagccgtg
4561 tgcacccatt gtaaacactc cccaccgtgc cctcagccag gatgtgtaac taaacgccca
4621 ccagtaccac ccagactgta cctgcccccct cctataccta taagacagcc taacacaa

FIG. 3C

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Parvovirus B19 clone #2-B6

```
   1 cccgccttat gcaaatgggc agccatctta agtgttttac tataatttta ttggtcagtt
  61 ttgtaacggt taaaatgggc ggagcgtagg caaggactac agtatatata gcacagcact
 121 gccgcagctc tttctttctg ggctgctttt ttcctggact tacttgctgt tttttgtgag
 181 ctaactaaca ggtatttata ctacttgtta acatactaac atggagctat ttagaggggt
 241 gcttcaagtt tcttctaatg ttctggactg tgctaacgat aactggtggt gctctttact
 301 ggatttagac acttctgact gggaaccact aactcatact aacagactaa tggcaatata
 361 cttaagcagt gtggcttcta agcttgactt tactgggggg ccactagcag ggtgcttgta
 421 ctttttttcaa gtagaatgta acaaatttga agaaggctat catattcatg tggttattgg
 481 ggggccaggg ttaaacccca gaaacctcac agtgtgtgta gaggggttat ttaataatgt
 541 actttatcac cttgtaactg aaaatctgaa gctaaaattt ttgccaggaa tgactacaaa
 601 aggcaaatac tttagagatg gagagcagtt tatagaaaac tatttaatga aaaaaatacc
 661 tttaaatgtt gtatggtgtg ttactaatat tgatggacat atagatacct gtatttctgc
 721 tacttttaga aagggagctt gccatgccaa gaaaccccgc atcaccacag ccataaatga
 781 tactagtact gatgctgggg agtctagcgg cacaggggca gaggttgtgc catttaatgg
 841 gaagggaact aaggctagca taaagtttca aactatggta aactggttgt gtgaaaacag
 901 agtgtttaca gaggataagt ggaaactagt tgactttaac cagtacactt tactaagcag
 961 tagtcacagt ggaagttttc aaattcaaag tgcactaaaa ctagcaattt ataaagcaac
1021 taatttagtg cctactagca catttttatt gcatacagac tttgagcaag ttatgtgtat
1081 taaagacaat aaaattgtta aattgttact ttgtcaaaac tatgaccccc tattagtggg
1141 gcagcatgtg ttaaagtgga ttgataaaaa atgtggcaag aaaaacacac tgtggtttta
1201 tggaccgcca agtacaggga aaacaaactt ggcaatggcc attgctaaaa gtgttccagt
1261 atatggcatg gttaactgga ataatgaaaa ctttccattt aatgatgtag caggaaaaag
1321 cttggtggtc tgggatgaag gtattattaa gtctacaatt gtagaagctg caaaagccat
1381 tttaggcggg caacccacca gggtagatca aaaaatgcgt ggaagtgtag ctgtgcctgg
1441 agtacccgtg gttataacca gcaatggtga cattactttt gttgtaagcg ggaacactac
1501 aacaactgta catgctaaag ccttaaaaga gcgcatggta aagttaaact ttactgtaag
1561 atgcagccct gacatggggt tactaacaga ggctgatgta caacagtggc ttacatggtg
1621 taatgcacaa agctgggacc actatgaaaa ctgggcaata aactacactt ttgatttccc
1681 tggaattaat gcagatgccc tccacccaga cctccaaacc accccaattg tcacagacac
1741 cagtatcagc agcagtggtg gtgaaagctc tgaagaactc agtgaaagca gctttttaa
1801 cctcatcacc ccaggcgcct ggaacactga aaccccgcgc tctagtacgc ccatccccgg
1861 gaccagttca ggagaatcat ctgtcggaag cccagtttcc tccgaagttg tagctgcatc
1921 gtgggaagaa gccttctaca caccttggc agaccagttt cgtgaactgt tagttggggt
1981 tgattatgtg tgggacggtg taaggggttt acctgtctgt tgtgtgcaac atattaacaa
2041 tagtgggggga ggcttgggac tttgtcccca ttgcattaat gtaggggctt ggtataatgg
```

FIG. 4A

2101 atggaaattt cgagaattta ccccagattt ggtgcgatgt agctgccatg tgggagcttc
2161 taatcccttt tctgtgctaa cctgcaaaaa atgtgcttac ctgtctggat tgcaaagctt
2221 tgtagattat gagtaaagaa agtggcaaat ggtgggaaag tgatgataaa tttgctaaag
2281 ctgtgtatca gcaatttgtg gaattttatg aaaaggttac tggaacagac ttagagctta
2341 ttcaaatatt aaaagatcat tataatattt ctttagataa tcccctagaa aacccatcct
2401 ctttgtttga cttagttgct cgtattaaaa ataaccttaa aaactctcca gacttatata
2461 gtcatcattt tcaaagtcat ggacagttat ctgaccaccc ccatgcctta tcatccagta
2521 gcagtcatgc agaacctaga ggagaagatg cagtattatc tagtgaagac ttacacaagc
2581 ctgggcaagt tagcgtacaa ctacccggta ctaactatgt tgggcctggc aatgagctac
2641 aagctgggcc cccgcaaagt gctgttgaca gtgctgcaag gattcatgac tttaggtata
2701 gccaactggc taagttggga ataaatccat atactcattg gactgtagca gatgaagagc
2761 ttttaaaaaa tataaaaaat gaaactgggt ttcaagcaca agtagtaaaa gactacttta
2821 ctttaaaagg tgcagctgcc cctgtggccc attttcaagg aagtttgccg gaagttcccg
2881 cttacaacgc ctcagaaaaa tacccaagca tgacttcagt taattctgca gaagccagca
2941 ctggtgcagg agggggggge agtaatcctg tgaaaagcat gtggagtgag ggggccactt
3001 ttagtgccaa ctctgtaact tgtacatttt ccagacaatt tttaattcca tatgacccag
3061 agcaccatta taaggtgttt tctcccgcag caagtagctg ccacaatgcc agtggaaagg
3121 aggcaaaggt ttgcaccatt agtcccataa tgggatactc aaccccatgg agatatttag
3181 attttaatgc tttaaattta ttttttcac ctttagagtt tcagcactta attgaaaatt
3241 atggaagtat agctcctgat gctttaactg taaccatatc agaaattgct gttaaggatg
3301 ttacaaacaa aactggaggg ggggtgcagg ttactgacag cactacaggg cgcctatgca
3361 tgttagtaga ccatgaatat aagtacccat atgtgttagg gcaaggtcaa gatactttag
3421 ccccagaact tcctatttgg gtatactttc cccctcaata cgcttactta acagtaggag
3481 atgttaacac acaaggaatt tctggagaca gcaaaaaatt ggcaagtgaa gaatcagcat
3541 tttatgtttt ggaacacagt tcttttcagc ttttaggtac aggaggtaca gcaactatgt
3601 cttataagtt tcctccagtg cccccagaaa atttagaggg ctgcagtcaa cacttttatg
3661 aaatgtacaa ccccttatac ggatcccgct taggggttcc tgacacatta ggaggtgacc
3721 caaaatttag atctttaaca catgaagacc atgcaattca gccccaaaac ttcatgccag
3781 ggccactagt aaactcagtg tctacaaagg agggagacag ctctagtact ggagctggaa
3841 aagccttaac aggccttagc acaggtacct ctcaaaacac tagaatatcc ttacgccctg
3901 ggccagtgtc tcagccgtac caccactggg acacagataa atatgtcaca ggaataaatg
3961 ccatttctca tggtcagacc acttatggta acgctgaaga caaagagtat cagcaaggag
4021 tgggtagatt tccaaatgaa aaagaacagc taaaacagtt acagggttta aacatgcaca
4081 cctactttcc caataaagga acccagcaat atacagatca aattgagcgc cccctaatgg
4141 tgggttctgt atggaacaga agagcccttc actatgaaag ccagctgtgg agtaaaattc
4201 caaatttaga tgacagtttt aaaactcagt ttgcagcctt aggaggatgg ggtttgcatc
4261 agccacctcc tcaaatattt ttaaaaatat taccacaaag tgggccaatt ggaggtatta

FIG. 4B

4321 aatcaatggg aattactacc ttagttcagt atgccgtggg aattatgaca gtaaccatga
4381 catttaaatt ggggcccccgt aaagctacgg gacggtggaa tcctcaacct ggagtgtatc
4441 ccccgcacgc agcaggtcat ttaccatatg tactatatga ccccacagct acagatgcaa
4501 aacaacacca cagacatgga tatgaaaagc ctgaagaatt gtggacagcc aaaagccgtg
4561 tgcacccatt gtaaacactc cccaccgtgc cctcagccag gatgtgtaac taaacgccca
4621 ccagtaccac ccagactgta cctgcccccct cctataccta taagacagcc taacacaa

FIG. 4C

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Clone B1-NS1 single stranded DNA sequence:

atactcttcgaacaaaacaaaatggagctatttagaggggtgcttcaagtttcttctaatgttctggactgtgctaacgataactggtggtgctctt
tactggatttagacacttctgactgggaaccactaactcatactaacagactaatggcaatatacttaagcagtgtggcttctaagcttgacttta
ctgggggggccactagcagggtgcttgtacttttttcaagtagaatgtaacaaatttgaagaaggctatcatattcatgtggttattgggggggcca
gggttaaaccccagaaacctcacagtgtgtgtagaggggttatttaataatgtactttatcaccttgtaactgaaaatctgaagctaaaatttttgc
caggaatgactacaaaaggcaaatactttagagatggagagcagtttatagaaaactatttaatgaaaaaaatacctttaaatgttgtatggtgt
gttactaatattgatggacatatagatacctgtatttctgctacttttagaaagggagcttgccatgccaagaaaccccgcatcaccacagccat
aaatgatactagtactgatgctggggagtctagcggcacaggggcagaggttgtgccatttaatgggaagggaactaaggctagcataaag
tttcaaactatggtaaactggttgtgtgaaaacagagtgtttacagaggataagtggaaactagttgactttaaccagtacactttactaagcagt
agtcacagtggaagttttcaaattcaaagtgcactaaaactagcaatttataaagcaactaatttagtgcctactagcacatttttattgcatacag
actttgagcaagttatgtgtattaaaaacaataaaattgttaaattgttactttgtcaaaactatgacccccctattagtggggcagcatgtgttaaag
tggattgataaaaaatgtggcaagaaaaacacactgtggttttatgggccgccaagtacagggaaaacaaacttggcaatggccattgctaa
aagtgttccagtatatggcatggttaactggaataatgaaaactttccatttaatgatgtagcaggaaaaagcttggtggtctgggatgaag
gtattattaagtctacaattgtagaagctgcaaaagccattttaggcgggcaacccaccagggtagatcaaaaaatgcgtggaagtgtagctg
tgcctggagtacctgtggttataaccagcaatggtgacattacttttgttgtaagcgggaacactacaacaactgtacatgctaaagccttaaaa
gagcgcatggtaaagttaaactttactgtaagatgcagccctgacatgggttactaacagaggctgatgtacaacagtggcttacatggtgt
aatgcacaaagctgggaccactatgaaaactgggcaataaactacacttttgatttccctggaattaatgcagatgccctccacccagacctcc
aaaccaccccaattgtcacagacaccagtatcagcagcagtggtggtgaaagctctgaagaactcagtgaaagcagctttttaacctcatca
ccccaggcgcctggaacactgaaaccccgcgctctagtacgcccatccccgggaccagttcaggagaatcatctgtcggaagcccagtttc
ctccgaagttgtagctgcatcgtgggaagaagccttctacacaccttggcagaccagtttcgtgaactgttagttggggttgattatgtgtggg
acggtgtaaggggtttacctgtctgttgtgtgcaacatattaacaatagtgggggaggcttgggactttgtccccattgcattaatgtaggggct
tggtataatggatggaaatttcgagaatttaccccagatttggtgcgatgtagctgccatgtgggagcttctaatccctttctgtgctaacctgca
aaaaatgtgcttacctgtctggattgcaaagctttgtagattatgagtaagtcgacatactc

FIG. 5A

Clone B1 NS1 amino acid sequence:

MELFRGVLQVSSNVLDCANDNWWCSLLDLDTSDWEPLTHTNRLMAIYLSSVAS
KLDFTGGPLAGCLYFFQVECNKFEEGYHIHVVIGGPGLNPRNLTVCVEGLFNNVLYHLVT
ENLKLKFLPGMTTKGKYFRDGEQFIENYLMKKIPLNVVWCVTNIDGHIDTCISATFRKGA
CHAKKPRITTAINDTSTDAGESSGTGAEVVPFNGKGTKASIKFQTMVNWLCENRVFTEDK
WKLVDFNQYTLLSSSHSGSFQIQSALKLAIYKATNLVPTSTFLLHTDFEQVMCIKNNKIV
KLLLCQNYDPLLVGQHVLKWIDKKCGKKNTLWFYGPPSTGKTNLAMAIAKSVPVYGMVNW
NNENFPFNDVAGKSLVVWDEGIIKSTIVEAAKAILGGQPTRVDQKMRGSVAVPGVPVVIT
SNGDITFVVSGNTTTTVHAKALKERMVKLNFTVRCSPDMGLLTEADVQQWLTWCNAQSWD
HYENWAINYTFDFPGINADALHPDLQTTPIVTDTSISSSGGESSEELSESSFFNLITPGA
WNTETPRSSTPIPGTSSGESSVGSPVSSEVVAASWEEAFYTPLADQFRELLVGVDYVWDG
VRGLPVCCVQHINNSGGGLGLCPHCINVGAWYNGWKFREFTPDLVRCSCHVGASNPFSVL
TCKKCAYLSGLQSFVDYE

FIG. 5B

B1 VP1 single stranded DNA sequence:

atactcaagcttacaaaacaaaatgagtaaagaaagtggcaaatggtgggaaagtgatgataaatttgctaaagctgtgtatcagcaatttgtggaatttta
tgaaaaggttactggaacagacttagagcttattcaaatattaaaagatcattataatatttctttagataatcccctag
aaaacccatcctctttgtttgacttagttgctcgtattaaaaataaccttaaaaactctccagacttatatagtcatcat
tttcaaagtcatggacagttatctgaccacccccatgccttatcatccagtagcagtcatgcagaacctagaggagaaga
tgcagtattatctagtgaagacttacacaagcctgggcaagttagcgtacaactacccggtactaactatgttgggcctg
gcaatgagctacaagctgggcccccgcaaagtgctgttgacagtgctgcaaggattcatgactttaggtatagccaactg
gctaagttgggaataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgg
gtttcaagcacaagtagtaaaagactactttacttttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcactggtgca
ggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccactttagtgccaactctgtaacttgtacatt
ttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgcagcaagtagctgccacaatg
ccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactcaaccccatggagatatttagattttaat
gctttaaatttattttttttcacctttagagtttcagcacttaattgaaaattatggaagtatagctcctgatgctttaac
tgtaaccatatcagaaattgctgttaaggatgttacggacaaaactggaggggggggtgcaggttactgacagcactacag
ggcgcctatgcatgttagtagaccatgaatataagtacccatatgtgttagggcaaggtcaagatactttagccccagaa
cttcctatttgggtatactttccccctcaatacgcttacttaacagtaggagatgttaacacacaaggaatttctggaga
cagcaaaaaattggcaagtgaagaatcagcattttatgtttggaacacagttcttttcagcttttaggtacaggaggta
cagcaactatgtcttataagtttcctccagtgccccagaaaatttagagggctgcagtcaacacttttatgaaatgtac
aaccccttatacggatcccgcttaggggttcctgacacattaggaggtgacccaaaatttagatctttaacacatgaaga
ccatgcaattcagccccaaaacttcatgccagggccactagtaaactcagtgtctacaaaggagggagacagctctagta
ctggagctggaaaagccttaacaggccttagcacaggtacctctcaaaacactagaatatccttacgccctgggccagtg
tctcagccgtaccaccactgggacacagataaatatgtcacaggaataaatgccatttctcatggtcagaccacttatgg
taacgctgaagacaaagagtatcagcaaggagtgggtagatttccaaatgaaaaagaacagctaaaacagttacagggtt
taaacatgcacacctactttcccaataaggaacccagcaatatacagatcaaattgagcgccccctaatggtgggttct
gtatggaacagaagagcccttcactatgaaagccagctgtggagtaaaattccaaatttagatgacagttttaaaactca
gtttgcagccttaggaggatggggtttgcatcagccacctcctcaaatatttttaaaaatattaccacaaagtgggccaa
ttggaggtattaaatcaatgggaattactaccttagttcagtatgccgtgggaattatgacagtaaccatgacatttaaa
ttggggccccgtaaagctacgggacggtggaatcctcaacctggagtgtatccccgcacgcagcaggtcatttaccata
tgtactatatgaccccacagctacagatgcaaaacaacaccacagacatggatatgaaaagcctgaagaattgtggacag
ccaaaagccgtgtgcacccattgtaagtcgacatactc

FIG. 6A

B1 VP1 amino acid sequence:

MSKESGKWWESDDKFAKAVYQQFVEFYEKVTGTDLELIQILKDHYNISLDNPL
ENPSSLFDLVARIKNNLKNSPDLYSHHFQSHGQLSDHPHALSSSSSHAEPRGEDAVLSSE
DLHKPGQVSVQLPGTNYVGPGNELQAGPPQSAVDSAARIHDFRYSQLAKLGINPYTHWTV
ADEELLKNIKNETGFQAQVVKDYFTLKGAAAPVAHFQGSLPEVPAYNASEKYPSMTSVNS
AEASTGAGGGGSNPVKSMWSEGATFSANSVTCTFSRQFLIPYDPEHHYKVFSPAASSCHN
ASGKEAKVCTISPIMGYSTPWRYLDFNALNLFFSPLEFQHLIENYGSIAPDALTVTISEI
AVKDVTDKTGGGVQVTDSTTGRLCMLVDHEYKYPYVLGQGQDTLAPELPIWVYFPPQYAY
LTVGDVNTQGISGDSKKLASEESAFYVLEHSSFQLLGTGGTATMSYKFPPVPPENLEGCS
QHFYEMYNPLYGSRLGVPDTLGGDPKFRSLTHEDHAIQPQNFMPGPLVNSVSTKEGDSSS
TGAGKALTGLSTGTSQNTRISLRPGPVSQPYHHWDTDKYVTGINAISHGQTTYGNAEDKE
YQQGVGRFPNEKEQLKQLQGLNMHTYFPNKGTQQYTDQIERPLMVGSVWNRRALHYESQL
WSKIPNLDDSFKTQFAALGGWGLHQPPPQIFLKILPQSGPIGGIKSMGITTLVQYAVGIM
TVTMTFKLGPRKATGRWNPQPGVYPPHAAGHLPYVLYDPTATDAKQHHRHGYEKPEELWT
AKSRVHPL

FIG. 6B

B1 VP2 single stranded DNA sequence:

atactcaagcttacaaaacaaaatgacttcagttaattctgcagaagccagcactggtgcaggagggggggcagtaatcctgtgaaaagcatgtggagtgaggggc
cacttttagtgccaactctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccatt
ataaggtgttttctcccgcagcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccata
atgggatactcaaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcactt
aattgaaaattatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggaca
aaactggaggggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagtaccca
tatgtgttagggcaaggtcaagatactttagccccagaacttcctatttgggtatactttccccctcaatacgcttactt
aacagtaggagatgttaacacacaaggaatttctggagacagcaaaaaattggcaagtgaagaatcagcattttatgttt
tggaacacagttcttttcagcttttaggtacaggaggtacagcaactatgtcttataagtttcctccagtgcccccagaa
aatttagagggctgcagtcaacactttatgaaatgtacaaccccttatacggatcccgcttaggggttcctgacacatt
aggaggtgacccaaaatttagatctttaacacatgaagaccatgcaattcagccccaaaacttcatgccagggccactag
taaactcagtgtctacaaaggagggagacagctctagtactggagctggaaaagccttaacaggccttagcacaggtacc
tctcaaaacactagaatatccttacgccctgggccagtgtctcagccgtaccaccactgggacacagataaatatgtcac
aggaataaatgccatttctcatggtcagaccacttatggtaacgctgaagacaaagagtatcagcaaggagtgggtagat
ttccaaatgaaaaagaacagctaaaacagttacagggtttaaacatgcacacctactttcccaataaaggaacccagcaa
tatacagatcaaattgagcgccccctaatggtgggttctgtatggaacagaagagcccttcactatgaaagccagctgtg
gagtaaaattccaaatttagatgacagttttaaaactcagtttgcagccttaggaggatgggttttgcatcagccacctc
ctcaaatatttttaaaaatattaccacaaagtgggccaattggaggtattaaatcaatgggaattactaccttagttcag
tatgccgtgggaattatgacagtaaccatgacatttaaattggggccccgtaaagctacgggacggtggaatcctcaacc
tggagtgtatccccccgcacgcagcaggtcatttaccatatgtactatatgaccccacagctacagatgcaaaacaacacc
acagacatggatatgaaaagcctgaagaattgtggacagccaaaagccgtgtgcacccattgtaagtcgacatactc

FIG. 7A

B1 VP2 amino acid sequence:

MTSVNSAEASTGAGGGGSNPVKSMWSEGATFSANSVTCTFSRQFLIPYDPEHH
YKVFSPAASSCHNASGKEAKVCTISPIMGYSTPWRYLDFNALNLFFSPLEFQHLIENYGS
IAPDALTVTISEIAVKDVTDKTGGGVQVTDSTTGRLCMLVDHEYKYPYVLGQGQDTLAPE
LPIWVYFPPQYAYLTVGDVNTQGISGDSKKLASEESAFYVLEHSSFQLLGTGGTATMSYK
FPPVPPENLEGCSQHFYEMYNPLYGSRLGVPDTLGGDPKFRSLTHEDHAIQPQNFMPGPL
VNSVSTKEGDSSSTGAGKALTGLSTGTSQNTRISLRPGPVSQPYHHWDTDKYVTGINAIS
HGQTTYGNAEDKEYQQGVGRFPNEKEQLKQLQGLNMHTYFPNKGTQQYTDQIERPLMVGS
VWNRRALHYESQLWSKIPNLDDSFKTQFAALGGWGLHQPPPQIFLKILPQSGPIGGIKSM
GITTLVQYAVGIMTVTMTFKLGPRKATGRWNPQPGVYPPHAAGHLPYVLYDPTATDAKQH
HRHGYEKPEELWTAKSRVHPL

FIG. 7B

B6 NS1 single stranded DNA sequence:

atactcttcgaacaaaacaaaatggagctatttagaggggtgcttcaagtttcttctaatgttctggactgtgctaacgataactggtggtgctctt
tactggatttagacacttctgactgggaaccactaactcatactaacagactaatggcaatatacttaagcagtgtggcttctaagcttgacttta
ctgggggggccactagcagggtgcttgtacttttttcaagtagaatgtaacaaatttgaagaaggctatcatattcatgtggttattgggggggcca
gggttaaaccccagaaacctcacagtgtgtgtagaggggttatttaataatgtactttatcaccttgtaactgaaaatctgaagctaaaatttttgc
caggaatgactacaaaaggcaaatactttagagatggagagcagtttatagaaaactatttaatgaaaaaaataccttaaatgttgtatggtgt
gttactaatattgatggacatatagatacctgtatttctgctacttttagaaagggagcttgccatgccaagaaaccccgcatcaccacagccat
aaatgatactagtactgatgctggggagtctagcggcacaggggcagaggttgtgccatttaatgggaagggaactaaggctagcataaag
tttcaaactatggtaaactggttgtgtgaaaacagagtgtttacagaggataagtggaaactagttgactttaaccagtacactttactaagcagt
agtcacagtggaagttttcaaattcaaagtgcactaaaactagcaatttataaagcaactaatttagtgcctactagcacatttttattgcatacag
actttgagcaagttatgtgtattaaagacaataaaattgttaaattgttactttgtcaaaactatgacccccctattagtggggcagcatgtgttaaag
tggattgataaaaaatgtggcaagaaaaacacactgtggttttatggaccgccaagtacagggaaaacaaacttggcaatggccattgctaa
aagtgttccagtatatggcatggttaactggaataatgaaaactttccatttaatgatgtagcaggaaaaagcttggtggtctgggatgaaggta
ttattaagtctacaattgtagaagctgcaaaagccattttaggcgggcaacccaccagggtagatcaaaaaatgcgtggaagtgtagctgtgc
ctggagtacccgtggttataaccagcaatggtgacattacttttgttgtaagcgggaacactacaacaactgtacatgctaaagccttaaaaga
gcgcatggtaaagttaaactttactgtaagatgcagccctgacatggggttactaacagaggctgatgtacaacagtggcttacatggtgtaat
gcacaaagctgggaccactatgaaaactgggcaataaactacacttttgatttccctggaattaatgcagatgccctccacccagacctccaa
accaccccaattgtcacagacaccagtatcagcagcagtggtggtgaaagctctgaagaactcagtgaaagcagctttttaacctcatcacc
ccaggcgcctggaacactgaaaccccgcgctctagtacgcccatccccgggaccagttcaggagaatcatctgtcggaagcccagtttcc
tccgaagttgtagctgcatcgtgggaagaagccttctacacacctttggcagaccagtttcgtgaactgttagttggggttgattatgtgtggga
cggtgtaaggggtttacctgtctgttgtgtgcaacatattaacaatagtgggggaggcttgggactttgtccccattgcattaatgtaggggctt
ggtataatggatggaaatttcgagaatttaccccagatttggtgcgatgtagctgccatgtgggagcttctaatccctttctgtgctaacctgca
aaaaatgtgcttacctgtctggattgcaaagctttgtagattatgagtaagtcgacatactc

FIG. 8A

B6 NS1 amino acid sequence:

MELFRGVLQVSSNVLDCANDNWWCSLLDLDTSDWEPLTHTNRLMAIYLSSVAS
KLDFTGGPLAGCLYFFQVECNKFEEGYHIHVVIGGPGLNPRNLTVCVEGLFNNVLYHLVT
ENLKLKFLPGMTTKGKYFRDGEQFIENYLMKKIPLNVVWCVTNIDGHIDTCISATFRKGA
CHAKKPRITTAINDTSTDAGESSGTGAEVVPFNGKGTKASIKFQTMVNWLCENRVFTEDK
WKLVDFNQYTLLSSSHSGSFQIQSALKLAIYKATNLVPTSTFLLHTDFEQVMCIKDNKIV
KLLLCQNYDPLLVGQHVLKWIDKKCGKKNTLWFYGPPSTGKTNLAMAIAKSVPVYGMVNW
NNENFPFNDVAGKSLVVWDEGIIKSTIVEAAKAILGGQPTRVDQKMRGSVAVPGVPVVIT
SNGDITFVVSGNTTTTVHAKALKERMVKLNFTVRCSPDMGLLTEADVQQWLTWCNAQSWD
HYENWAINYTFDFPGINADALHPDLQTTPIVTDTSISSSGGESSEELSESSFFNLITPGA
WNTETPRSSTPIPGTSSGESSVGSPVSSEVVAASWEEAFYTPLADQFRELLVGVDYVWDG
VRGLPVCCVQHINNSGGGLGLCPHCINVGAWYNGWKFREFTPDLVRCSCHVGASNPFSVL
TCKKCAYLSGLQSFVDYE

FIG. 8B

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B6 VP1 single stranded DNA sequence:

atactcaagcttacaaaacaaaatgagtaaagaaagtggcaaatggtgggaaagtgatgataaatttgctaaagctgtgtatcagcaatttgtg
gaattttatgaaaaggttactggaacagacttagagcttattcaaatattaaaagatcattataatatttctttagataatcccctagaaaacccatc
ctctttgtttgacttagttgctcgtattaaaaataaccttaaaaactctccagacttatatagtcatcattttcaaagtcatggacagttatctgaccac
ccccatgccttatcatccagtagcagtcatgcagaacctagaggagaagatgcagtattatctagtgaagacttacacaagcctgggcaagtt
agcgtacaactacccggtactaactatgttgggcctggcaatgagctacaagctgggcccccgcaaagtgctgttgacagtgctgcaaggat
tcatgactttaggtatagccaactggctaagttgggaataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaa
tgaaactgggtttcaagcacaagtagtaaaagactactttacttttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgccggaa
gttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcactggtgcaggaggggggggcagta
atcctgtgaaaagcatgtggagtgagggggccacttttagtgccaactctgtaacttgtacattttccagacaatttttaattccatatgacccag
agcaccattataaggtgttttctcccgcagcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgg
gatactcaaccccatggagatatttagattttaatgctttaaatttatttttttcaccttagagtttcagcacttaattgaaaattatggaagtatagct
cctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacaaacaaaactggaggggggggtgcaggttactgacagcactaca
gggcgcctatgcatgttagtagaccatgaatataagtacccatatgtgttagggcaaggtcaagatactttagccccagaacttcctatttgggt
atactttccccctcaatacgcttacttaacagtaggagatgttaacacacaaggaatttctggagacagcaaaaaattggcaagtgaagaatca
gcattttatgttttggaacacagttcttttcagcttttaggtacaggaggtacagcaactatgtcttataagtttcctccagtgcccccagaaaattt
agagggctgcagtcaacacttttatgaaatgtacaaccccttatacggatcccgcttaggggttcctgacacattaggaggtgacccaaaattt
agatctttaacacatgaagaccatgcaattcagccccaaaacttcatgccagggccactagtaaactcagtgtctacaaaggagggagacag
ctctagtactggagctggaaaagccttaacaggccttagcacaggtacctctcaaaacactagaatatccttacgccctgggccagtgtctca
gccgtaccaccactgggacacagataaatatgtcacaggaataaatgccatttctcatggtcagaccacttatggtaacgctgaagacaaag
agtatcagcaaggagtgggtagatttccaaatgaaaaagaacagctaaaacagttacagggtttaaacatgcacacctactttcccaataaag
gaacccagcaatatacagatcaaattgagcgcccctaatggtgggttctgtatggaacagaagagcccttcactatgaaagccagctgtgg
agtaaaattccaaatttagatgacagtttaaaactcagtttgcagccttaggaggatggggtttgcatcagccacctcctcaaatattCttaaaa
atattaccacaaagtgggccaa ttggaggtattaaatcaatgggaattactaccttagttcagtatgccgtgggaattatgacagtaaccatga
catttaaa ttggggccccgtaaagctacgggacggtggaatcctcaacctggagtgtatccccgcacgcagcaggtcatttaccata tgta
ctatatgaccccacagctacagatgcaaaacaacaccacagacatggatatgaaaagcctgaagaattgtggacagccaaaagccgt gtg
cacccattgtaagtcgacatactc

FIG. 9A

B6 VP1 amino acid sequence:

MSKESGKWWESDDKFAKAVYQQFVEFYEKVTGTDLELIQILKDHYNISLDNPL
ENPSSLFDLVARIKNNLKNSPDLYSHHFQSHGQLSDHPHALSSSSSHAEPRGEDAVLSSE
DLHKPGQVSVQLPGTNYVGPGNELQAGPPQSAVDSAARIHDFRYSQLAKLGINPYTHWTV
ADEELLKNIKNETGFQAQVVKDYFTLKGAAAPVAHFQGSLPEVPAYNASEKYPSMTSVNS
AEASTGAGGGGSNPVKSMWSEGATFSANSVTCTFSRQFLIPYDPEHHYKVFSPAASSCHN
ASGKEAKVCTISPIMGYSTPWRYLDFNALNLFFSPLEFQHLIENYGSIAPDALTVTISEI
AVKDVTNKTGGGVQVTDSTTGRLCMLVDHEYKYPYVLGQGQDTLAPELPIWVYFPPQYAY
LTVGDVNTQGISGDSKKLASEESAFYVLEHSSFQLLGTGGTATMSYKFPPVPPENLEGCS
QHFYEMYNPLYGSRLGVPDTLGGDPKFRSLTHEDHAIQPQNFMPGPLVNSVSTKEGDSSS
TGAGKALTGLSTGTSQNTRISLRPGPVSQPYHHWDTDKYVTGINAISHGQTTYGNAEDKE
YQQGVGRFPNEKEQLKQLQGLNMHTYFPNKGTQQYTDQIERPLMVGSVWNRRALHYESQL
WSKIPNLDDSFKTQFAALGGWGLHQPPPQIFLKILPQSGPIGGIKSMGITTLVQYAVGIM
TVTMTFKLGPRKATGRWNPQPGVYPPHAAGHLPYVLYDPTATDAKQHHRHGYEKPEELWT
AKSRVHPL

FIG. 9B

B6 VP2 single stranded DNA sequence:

atactcaagcttacaaaacaaaatgacttcagttaattctgcagaagccagcactggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggc
cacttttagtgccaactctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccatt
ataaggtgttttctcccgcagcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccata
atgggatactcaaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcactt
aattgaaaattatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacaaaca
aaactggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagtaccca
tatgtgttagggcaaggtcaagatactttagccccagaacttcctatttgggtatactttccccctcaatacgcttactt
aacagtaggagatgttaacacacaaggaatttctggagacagcaaaaaattggcaagtgaagaatcagcattttatgttt
tggaacacagttcttttcagcttttaggtacaggaggtacagcaactatgtcttataagtttcctccagtgccccagaa
aatttagagggctgcagtcaacacttttatgaaatgtacaacccctttatacggatcccgcttaggggttcctgacacatt
aggaggtgacccaaaatttagatctttaacacatgaagaccatgcaattcagccccaaaacttcatgccagggccactag
taaactcagtgtctacaaaggagggagacagctctagtactggagctggaaaagccttaacaggccttagcacaggtacc
tctcaaaacactagaatatccttacgccctgggccagtgtctcagccgtaccaccactgggacacagataaatatgtcac
aggaataaatgccatttctcatggtcagaccacttatggtaacgctgaagacaaagagtatcagcaaggagtgggtagat
ttccaaatgaaaaagaacagctaaaacagttacagggtttaaacatgcacacctactttcccaataaaggaacccagcaa
tatacagatcaaattgagcgccccctaatggtgggttctgtatggaacagaagagcccttcactatgaaagccagctgtg
gagtaaaattccaaatttagatgacagttttaaaactcagtttgcagccttaggaggatggggtttgcatcagccacctc
ctcaaatatttttaaaaatattaccacaaagtgggccaattggaggtattaaatcaatgggaattactaccttagttcag
tatgccgtgggaattatgacagtaaccatgacatttaaattggggccccgtaaagctacgggacggtggaatcctcaacc
tggagtgtatcccccgcacgcagcaggtcatttaccatatgtactatatgaccccacagctacagatgcaaaacaacacc
acagacatggatatgaaaagcctgaagaattgtggacagccaaaagccgtgtgcacccattgtaagtcgacatactc

FIG. 10A

B6 VP2 amino acid sequence:

MTSVNSAEASTGAGGGGSNPVKSMWSEGATFSANSVTCTFSRQFLIPYDPEHH
YKVFSPAASSCHNASGKEAKVCTISPIMGYSTPWRYLDFNALNLFFSPLEFQHLIENYGS
IAPDALTVTISEIAVKDVTNKTGGGVQVTDSTTGRLCMLVDHEYKYPYVLGQGQDTLAPE
LPIWVYFPPQYAYLTVGDVNTQGISGDSKKLASEESAFYVLEHSSFQLLGTGGTATMSYK
FPPVPPENLEGCSQHFYEMYNPLYGSRLGVPDTLGGDPKFRSLTHEDHAIQPQNFMPGPL
VNSVSTKEGDSSSTGAGKALTGLSTGTSQNTRISLRPGPVSQPYHHWDTDKYVTGINAIS
HGQTTYGNAEDKEYQQGVGRFPNEKEQLKQLQGLNMHTYFPNKGTQQYTDQIERPLMVGS
VWNRRALHYESQLWSKIPNLDDSFKTQFAALGGWGLHQPPPQIFLKILPQSGPIGGIKSM
GITTLVQYAVGIMTVTMTFKLGPRKATGRWNPQPGVYPPHAAGHLPYVLYDPTATDAKQH
HRHGYEKPEELWTAKSRVHPL

FIG. 10B

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CH80-1

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgttaaaagcatgtggagtgaggggccactttagtgccaact
ctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactc
aaccccatggagatatttagattttaatgctttaaatttgtttttttcacctttagagtttcagcatttaattgaaaact
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaactg
gagggggagtacaagttactgacagcactaccgggcgcctatgcatgttagtagaccatgaatacaagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 11A

CH81-3

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgttaaaagcatgtggagtgaggggccactttagtgccaact
ctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttcgcccgca
gcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactc
aaccccatggagatacttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaatt
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaactg
gagggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatacaagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 11B

B19SCL1-4

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgagggggccacttttagtgccaac
tctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactc
aaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaatt
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaactg
gagggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 11C

B19SCL2-1

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgagggggccacttttagtgccaac
tctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactc
aaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaatt
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaactg
gagggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 11D

B19SCL3-1

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgagggggccacttttagtgccaac
tctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactc
aaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaatt
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaactg
gagggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 11E

B19SCL4-3

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgagggggccacttttagtgccaac
tctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactc
aaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaatt
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaactg
gagggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 11F

B19SCL5-2

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttcaa
gcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgcc
ggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagcac
tggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgagggggccacttttagtgccaac
tctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgca
gcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatactc
aaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaatt
atggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaactg
gagggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagtac
ccatatgtgttagggcaaggtcaggatactttag

FIG. 11G

B19SCL6-2

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgagggggccacttttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggagggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 11H

B19SCL7-3

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccacttttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 11I

B19SCL8-2

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccacttttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttaggttttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 11J

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B19SCL9-1

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcaattaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtcaaaagcatgtggagtgagggggccacttttagtgccaa
ctctgtaacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccg
cagccagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatac
tcaaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaa
ttatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaac
tggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagt
acccatatgtgttagggcaaggtcaggatactttag

FIG. 11K

B19SCL9-9

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgagggggccacttttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 11L

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B19SCL10-2

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccacttttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 11M

B19SCL11-1

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccacttttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttat

FIG. 11N

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B19SCL12-1

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtcaaaagcatgtggagtgagggggccacttttagtgccaa
ctctgtgacttgtacattttccagacagtttttaattccatatgacccagagcaccattataaggtgttttctcccg
cagcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtccgataatgggatac
tcaaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaa
ttatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacagacaaaact
ggaggggggtgcaagttactgacagcagtacagggcgcctatgcatgttagtagaccatgaatacaagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 11O

B19SCL13-3

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgagggggccacttttagtgccaa
ctctgtaacttgtgcattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccg
cagcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatac
tcaaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaa
ttatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaac
tggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagt
acccatatgtgttagggcaaggtcaggatactttag

FIG. 11P

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B19SCL14-1

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccacttttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 11Q

B19SCL15-3

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccacttttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 11R

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B19SCL16-2

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccacttttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttat

FIG. 11S

B19SCL17-1

ataaatccatatacttattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccacttttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 11T

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B19SCL18-1

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccacttttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 11U

B19SCL19-1

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccacttttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 11V

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B19SCL20-3

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccacttttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 11W

B19SCL21-3

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccacttttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 11X

B19SCL22-11

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcgggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccactttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatttagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 11Y

B19SCL2-14

ataaatccatatactcattggactgtagcagatgaagagcttttaaaaaatataaaaaatgaaactgggtttca
agcacaagtagtaaaagactactttactttaaaaggtgcagctgcccctgtggcccattttcaaggaagtttgc
cggaagttcccgcttacaacgcctcagaaaaatacccaagcatgacttcagttaattctgcagaagccagca
ctggtgcaggaggggggggcagtaatcctgtgaaaagcatgtggagtgaggggccactttagtgccaa
ctctgtaacttgtacattttccagacaatttttaattccatatgacccagagcaccattataaggtgttttctcccgc
agcaagtagctgccacaatgccagtggaaaggaggcaaaggtttgcaccattagtcccataatgggatact
caaccccatggagatatctagattttaatgctttaaatttatttttttcacctttagagtttcagcacttaattgaaaat
tatggaagtatagctcctgatgctttaactgtaaccatatcagaaattgctgttaaggatgttacggacaaaact
ggaggggggtgcaggttactgacagcactacagggcgcctatgcatgttagtagaccatgaatataagta
cccatatgtgttagggcaaggtcaggatactttag

FIG. 11Z

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FIGURE 12

GAATTCACTTGTACATTTTCCAGACAATTTTTAATTCCATATGACCCAGAGCACCATTAT
ACAGTGACATGCAGGTCTAGCTCTGCCACAATGCCAGTGGAAAGGAGGCAAAGGTTTGCA
CCATTAGTCCCATAATGGGATACTCAACCCCATGGAGATATTTAGATTTTAATGCTTTAA
ATTTATTTTTTTCACCTTTAGAGTTTCAGCACTTAATTGAAAATTATGGAAGTATAGCTC
CTGATGCTTTAACTGTAACCATATCAGAAATTGCTGTTAAGGATGTTACGGACAAAACTG
GAGGGGGGGTGCAGGTTACTGACAGCACTACAGGGCGCCTATGCATGTTAGTAGACCATG
AATATAAGTACCCATATGTGTTAGGGCAAGGTCAAGATACTTTAGCCCCAGAACTTCCTA
TTTGGGTATACTTTCCCCCTCAATACGCTTACTTAACAGTAGGAGATGTTAACACACAAG
GAATTTCTGGAGACAGCAAAAAATTGGCAAGTGAAGAATCAGCATTTTATGTTTTGGAAC
ACAGTTCTTTTCAGCTTTTAGGTACAGGAGGTACAGCAACTATGTCTTATAAGTTTCCTC
CAGTGCCCCCAGAAAATTTAGAGGGCTGCAGTCAACACTTTTATGAAATGTACAACCCCT
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<110> CHIRON CORPORATION

<120> DIAGNOSTIC ASSAYS FOR PARVOVIRUS B19

<130> 2301-17194.40

<140>
<141>

<160> 92

<170> PatentIn Ver. 2.0

<210> 1
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH47-26

<400> 1
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gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg ttaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaatttg 480
tttttttcac ctttagagtt tcagcattta attgaaaact atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggagtacaag ttactgacag cactaccggg cgcctatgca tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 2
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH48-29

<400> 2
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaacaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggtggc 240
agtaatcctg ccaaaagcat gtggagtgag ggggccactt ttactgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag ctagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aactccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcaccta attgaaaatt atggaagtat agctcctgat 540
gatttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggggtacagg ttactgacag cactacaggg cgcctatgcc tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 3
<211> 700
<212> DNA

<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH33-2

<400> 3
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaacaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggtggc 240
agtaatcctg ccaaaagcat gtggagtgag ggggccactt ttactgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag ctagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aactccatgg agatatttag attttaatgc tttaaattta 480
ttttttttcac ctttagagtt tcagcaccta attgaaaatt atggaagtat agctcctgat 540
gatttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggggtacagg ttactgacag cactacaggg cgcctatgct tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 4
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH33-3

<400> 4
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaca 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggtggc 240
agtaatcctg ccaaaagcat gtggagtgag ggggccactt ttactgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag ctagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aactccatgg agatatttag attttaatgc tttaaattta 480
ttttttttcac ctttagagtt tcagcaccta attgaaaatt atggaagtat agctcctgat 540
gatttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggggtacagg ttactgacag cactacaggg cgcctatgcc tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 5
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH33-4

<400> 5
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggtggc 240
agtaatcctg ccaaaagcat gtggagtgag ggggccactt ttactgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag ctagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aactccatgg agatatttag attttaatgc tttaaattta 480
ttttttttcac ctttagagtt tcagcaccta attgaaaatt atggaagtat agctcctgat 540
gatttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggggtacagg ttactgacag cactacaggg cgcctatgcc tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 6
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH42-7

<400> 6
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tcaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccaggcagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggggtacagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 7
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH42-18

<400> 7
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tcaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 8
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH42-19

<400> 8
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tcaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600

ggggtacagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 9
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH46-23

<400> 9
attaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaancaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tcaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccaggcagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggggtacagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 10
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH1-1

<400> 10
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tcaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggggtacagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 11
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH1-6

<400> 11
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tcaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420

agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggggtacagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 12
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH2-8

<400> 12
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 13
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH2-10

<400> 13
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacag aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 14
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH2-11C

<400> 14
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240

agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 15
<211> 699
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH5-13

<400> 15
ctaaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg ttaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaaag aggcaaaggt ttgcactatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttttcac ctttagagtt tcagcactta attgaaaatt atggcagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggggtacagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatac 660
aagtacccaa tgtgttaggg caaggtcagg atactttag 699

<210> 16
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH7-22

<400> 16
ataaatccat gtactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg ttaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaatttg 480
ttttttttcac ctttagagtt tcagcattta attgaaaact atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggagtacaag ttactgacag cactaccggg cgcctatgca tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 17
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH13-27

<400> 17
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60

gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaattctg tcaaaagcat gtggagtgag ggggccactt ttagtgctaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag cgagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatc 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggggtacagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 18
<211> 699
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH14-33

<400> 18
ataaatccat atactcattg gactgtggca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggga 240
gtaatcctgt taaaagcatg tggagtgagg gggccacttt tagtgccaac tctgtaactt 300
gtacattttc cagacagttt ttaattccat atgacccaga gcaccattat aaggtgtttt 360
ctcccgcagc aagtagctgc cacaatgcca gtggaaaaga ggcaaaggtt tgcaccatta 420
gtcccataat gggatactca accccatgga gatatttaga ttttaatgct ttaaatttat 480
ttttttcacc tttagagttt cagcacttaa ttgaaaatta tggtagtata gctcctgatg 540
ctttaactgt aaccatatca gaaattgctg ttaaagatgt tacagacaaa actggagggg 600
gggtacaggt tactgacagc actacagggc gcctatgcat gttagtggac catgaataca 660
agtacccata tgtgttaggg caaggtcagg atactttag 699

<210> 19
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH62-2

<400> 19
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcaat taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tcaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacakttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag ccagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggggtacagg ttactgacag cactacaggc cgcctatgca tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 20
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH64-2

<400> 20
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg ttaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tcgcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatacttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 21
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH67-2

<400> 21
ataaatccat atactcattg gactgtggca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggg 240
agtaatcctg ttaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaaag aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaagatg ttacagacaa aactggaggg 600
ggggtacagg ttactgacag cactacaggg cgcctatgca tgttagtgga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 22
<211> 4678
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: 4.7 kbp PCR fragment
from parvovirus B19 clone 2-B1

<400> 22
cccgccttat gcaaatgggc agccatctta agtgttttac tataatttta ttggtcagtt 60
ttgtaacggt taaaatgggc ggagcgtagg caaggactac agtatatata gcacagcact 120
gccgcagctc tttctttctg ggctgctttt ttcctggact tacttgctgt tttttgtgag 180
ctaactaaca ggtatttata ctacttgtta acatactaac atggagctat ttagaggggt 240
gcttcaagtt tcttctaatg ttctggactg tgctaacgat aactggtggt gctctttact 300
ggatttagac acttctgact gggaaccact aactcatact aacagactaa tggcaatata 360
cttaagcagt gtggcttcta agcttgactt tactgggggg ccactagcag ggtgcttgta 420
ctttttttcaa gtagaatgta acaaatttga agaaggctat catattcatg tggttattgg 480
ggggccaggg ttaaacccca gaaacctcac agtgtgtgta gaggggttat ttaataatgt 540
actttatcac cttgtaactg aaaatctgaa gctaaaattt ttgccaggaa tgactacaaa 600
aggcaaatac tttagagatg gagagcagtt tatagaaaac tatttaatga aaaaaatacc 660
tttaaatgtt gtatggtgtg ttactaatat tgatggacat atagatacct gtatttctgc 720
tacttttaga aagggagctt gccatgccaa gaaacccccgc atcaccacag ccataaatga 780
tactagtact gatgctgggg agtctagcgg cacaggggca gaggttgtgc catttaatgg 840
gaagggaact aaggctagca taaagtttca aactatggta aactggttgt gtgaaaacag 900
agtgtttaca gaggataagt ggaaactagt tgactttaac cagtacactt tactaagcag 960
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taatttagtg cctactagca cattttttatt gcatacagac tttgagcaag ttatgtgtat 1080
taaaaacaat aaaattgtta aattgttact ttgtcaaaac tatgaccccc tattagtggg 1140
gcagcatgtg ttaaagtgga ttgataaaaa atgtggcaag aaaaacacac tgtggtttta 1200
tgggccgcca agtacaggga aaacaaactt ggcaatggcc attgctaaaa gtgttccagt 1260
atatggcatg gttaactgga ataatgaaaa ctttccattt aatgatgtag caggaaaaag 1320
cttggtggtc tgggatgaag gtattattaa gtctacaatt gtagaagctg caaaagccat 1380
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aacaactgta catgctaaag ccttaaaaga gcgcatggta aagttaaact ttactgtaag 1560
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cagtatcagc agcagtggtg gtgaaagctc tgaagaactc agtgaaagca gctttttaa 1800
cctcatcacc ccaggcgcct ggaacactga aaccccgcgc tctagtacgc ccatccccgg 1860
gaccagttca ggagaatcat ctgtcggaag cccagtttcc tccgaagttg tagctgcatc 1920
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gcagtcatgc agaacctaga ggagaagatg cagtattatc tagtgaagac ttacacaagc 2580
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catttaaatt ggggcccccgt aaagctacgg gacggtggaa tcctcaacct ggagtgtatc 4440
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aacaacacca cagacatgga tatgaaaagc ctgaagaatt gtggacagcc aaaagccgtg 4560
tgcacccatt gtaaacactc cccaccgtgc cctcagccag gatgtgtaac taaacgccca 4620
ccagtaccac ccagactgta cctgcccccc cctataccta taagacagcc taacacaa 4678

<210> 23

<211> 4678
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: 4.7 kbp PCR fragment
from parvovirus B19 clone 2-B6

<400> 23
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ttgtaacggt taaaatgggc ggagcgtagg caaggactac agtatatata gcacagcact 120
gccgcagctc tttctttctg ggctgctttt ttcctggact tacttgctgt tttttgtgag 180
ctaactaaca ggtatttata ctacttgtta acatactaac atggagctat ttagaggggt 240
gcttcaagtt tcttctaatg ttctggactg tgctaacgat aactggtggt gctctttact 300
ggatttagac acttctgact gggaaccact aactcatact aacagactaa tggcaatata 360
cttaagcagt gtggcttcta agcttgactt tactgggggg ccactagcag ggtgcttgta 420
ctttttttcaa gtagaatgta acaaatttga agaaggctat catattcatg tggttattgg 480
ggggccaggg ttaaacccca gaaacctcac agtgtgtgta gaggggttat ttaataatgt 540
actttatcac cttgtaactg aaaatctgaa gctaaaattt ttgccaggaa tgactacaaa 600
aggcaaatac tttagagatg gagagcagtt tatagaaaac tatttaatga aaaaaatacc 660
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gaagggaact aaggctagca taaagtttca aactatggta aactggttgt gtgaaaacag 900
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atggaagtat agctcctgat gctttaactg taaccatatc agaaattgct gttaaggatg 3300
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ccccgcacgc agcaggtcat ttaccatatg tactatatga ccccacagct acagatgcaa 4500
aacaacacca cagacatgga tatgaaaagc ctgaagaatt gtggacagcc aaaagccgtg 4560
tgcacccatt gtaaacactc cccaccgtgc cctcagccag gatgtgtaac taaacgccca 4620
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<210> 24
<211> 2049
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: NS1 from
parvovirus B19 clone 2-B1

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tgggaaccac taactcatac taacagacta atggcaatat acttaagcag tgtggcttct 180
aagcttgact ttactggggg gccactagca gggtgcttgt actttttca agtagaatgt 240
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agaaacctca cagtgtgtgt agaggggtta tttaataatg tactttatca ccttgtaact 360
gaaaatctga agctaaaatt tttgccagga atgactacaa aaggcaaata ctttagagat 420
ggagagcagt ttatagaaaa ctatttaatg aaaaaaatac ctttaaatgt tgtatggtgt 480
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tgccatgcca agaaaccccg catcaccaca gccataaatg atactagtac tgatgctggg 600
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tggaacactg aaaccccgcg ctctagtacg cccatccccg ggaccagttc aggagaatca 1680

tctgtcggaa gcccagtttc ctccgaagtt gtagctgcat cgtgggaaga agccttctac 1740
acacctttgg cagaccagtt tcgtgaactg ttagttgggg ttgattatgt gtgggacggt 1800
gtaaggggtt tacctgtctg ttgtgtgcaa catattaaca atagtggggg aggcttggga 1860
ctttgtcccc attgcattaa tgtaggggct tggtataatg gatggaaatt tcgagaattt 1920
accccagatt tggtgcgatg tagctgccat gtgggagctt ctaatccctt ttctgtgcta 1980
acctgcaaaa aatgtgctta cctgtctgga ttgcaaagct ttgtagatta tgagtaagtc 2040
gacatactc 2049

<210> 25
<211> 671
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: NS1 amino acid from parvovirus B19 clone 2-B1

<400> 25
Met Glu Leu Phe Arg Gly Val Leu Gln Val Ser Ser Asn Val Leu Asp
1 5 10 15

Cys Ala Asn Asp Asn Trp Trp Cys Ser Leu Leu Asp Leu Asp Thr Ser
20 25 30

Asp Trp Glu Pro Leu Thr His Thr Asn Arg Leu Met Ala Ile Tyr Leu
35 40 45

Ser Ser Val Ala Ser Lys Leu Asp Phe Thr Gly Gly Pro Leu Ala Gly
50 55 60

Cys Leu Tyr Phe Phe Gln Val Glu Cys Asn Lys Phe Glu Glu Gly Tyr
65 70 75 80

His Ile His Val Val Ile Gly Gly Pro Gly Leu Asn Pro Arg Asn Leu
85 90 95

Thr Val Cys Val Glu Gly Leu Phe Asn Asn Val Leu Tyr His Leu Val
100 105 110

Thr Glu Asn Leu Lys Leu Lys Phe Leu Pro Gly Met Thr Thr Lys Gly
115 120 125

Lys Tyr Phe Arg Asp Gly Glu Gln Phe Ile Glu Asn Tyr Leu Met Lys
130 135 140

Lys Ile Pro Leu Asn Val Val Trp Cys Val Thr Asn Ile Asp Gly His
145 150 155 160

Ile Asp Thr Cys Ile Ser Ala Thr Phe Arg Lys Gly Ala Cys His Ala
165 170 175

Lys Lys Pro Arg Ile Thr Thr Ala Ile Asn Asp Thr Ser Thr Asp Ala
180 185 190

Gly Glu Ser Ser Gly Thr Gly Ala Glu Val Val Pro Phe Asn Gly Lys
195 200 205

Gly Thr Lys Ala Ser Ile Lys Phe Gln Thr Met Val Asn Trp Leu Cys
210 215 220

Glu Asn Arg Val Phe Thr Glu Asp Lys Trp Lys Leu Val Asp Phe Asn
225 230 235 240

```
Gln Tyr Thr Leu Leu Ser Ser Ser His Ser Gly Ser Phe Gln Ile Gln
                245                 250                 255

Ser Ala Leu Lys Leu Ala Ile Tyr Lys Ala Thr Asn Leu Val Pro Thr
            260                 265                 270

Ser Thr Phe Leu Leu His Thr Asp Phe Glu Gln Val Met Cys Ile Lys
        275                 280                 285

Asn Asn Lys Ile Val Lys Leu Leu Leu Cys Gln Asn Tyr Asp Pro Leu
    290                 295                 300

Leu Val Gly Gln His Val Leu Lys Trp Ile Asp Lys Lys Cys Gly Lys
305                 310                 315                 320

Lys Asn Thr Leu Trp Phe Tyr Gly Pro Pro Ser Thr Gly Lys Thr Asn
                325                 330                 335

Leu Ala Met Ala Ile Ala Lys Ser Val Pro Val Tyr Gly Met Val Asn
            340                 345                 350

Trp Asn Asn Glu Asn Phe Pro Phe Asn Asp Val Ala Gly Lys Ser Leu
        355                 360                 365

Val Val Trp Asp Glu Gly Ile Ile Lys Ser Thr Ile Val Glu Ala Ala
    370                 375                 380

Lys Ala Ile Leu Gly Gly Gln Pro Thr Arg Val Asp Gln Lys Met Arg
385                 390                 395                 400

Gly Ser Val Ala Val Pro Gly Val Pro Val Val Ile Thr Ser Asn Gly
                405                 410                 415

Asp Ile Thr Phe Val Val Ser Gly Asn Thr Thr Thr Thr Val His Ala
            420                 425                 430

Lys Ala Leu Lys Glu Arg Met Val Lys Leu Asn Phe Thr Val Arg Cys
        435                 440                 445

Ser Pro Asp Met Gly Leu Leu Thr Glu Ala Asp Val Gln Gln Trp Leu
    450                 455                 460

Thr Trp Cys Asn Ala Gln Ser Trp Asp His Tyr Glu Asn Trp Ala Ile
465                 470                 475                 480

Asn Tyr Thr Phe Asp Phe Pro Gly Ile Asn Ala Asp Ala Leu His Pro
                485                 490                 495

Asp Leu Gln Thr Thr Pro Ile Val Thr Asp Thr Ser Ile Ser Ser Ser
            500                 505                 510

Gly Gly Glu Ser Ser Glu Glu Leu Ser Glu Ser Ser Phe Phe Asn Leu
        515                 520                 525

Ile Thr Pro Gly Ala Trp Asn Thr Glu Thr Pro Arg Ser Ser Thr Pro
    530                 535                 540

Ile Pro Gly Thr Ser Ser Gly Glu Ser Ser Val Gly Ser Pro Val Ser
545                 550                 555                 560

Ser Glu Val Val Ala Ala Ser Trp Glu Glu Ala Phe Tyr Thr Pro Leu
                565                 570                 575
```

```
Ala Asp Gln Phe Arg Glu Leu Leu Val Gly Val Asp Tyr Val Trp Asp
            580                 585                 590

Gly Val Arg Gly Leu Pro Val Cys Cys Val Gln His Ile Asn Asn Ser
        595                 600                 605

Gly Gly Gly Leu Gly Leu Cys Pro His Cys Ile Asn Val Gly Ala Trp
    610                 615                 620

Tyr Asn Gly Trp Lys Phe Arg Glu Phe Thr Pro Asp Leu Val Arg Cys
625                 630                 635                 640

Ser Cys His Val Gly Ala Ser Asn Pro Phe Ser Val Leu Thr Cys Lys
                645                 650                 655

Lys Cys Ala Tyr Leu Ser Gly Leu Gln Ser Phe Val Asp Tyr Glu
            660                 665                 670
```

<210> 26
<211> 2380
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VP1 from parvovirus B19 clone 2-B1

<400> 26

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atactcaagc ttacaaaaca aaatgagtaa agaaagtggc aaatggtggg aaagtgatga 60
taaatttgct aaagctgtgt atcagcaatt tgtggaattt tatgaaaagg ttactggaac 120
agacttagag cttattcaaa tattaaaaga tcattataat atttctttag ataatcccct 180
agaaaaccca tcctctttgt ttgacttagt tgctcgtatt aaaaataacc ttaaaaactc 240
tccagactta tatagtcatc attttcaaag tcatggacag ttatctgacc acccccatgc 300
cttatcatcc agtagcagtc atgcagaacc tagaggagaa gatgcagtat tatctagtga 360
agacttacac aagcctgggc aagttagcgt acaactaccc ggtactaact atgttgggcc 420
tggcaatgag ctacaagctg ggcccccgca aagtgctgtt gacagtgctg caaggattca 480
tgactttagg tatagccaac tggctaagtt gggaataaat ccatatactc attggactgt 540
agcagatgaa gagcttttaa aaaatataaa aaatgaaact gggtttcaag cacaagtagt 600
aaaagactac tttactttaa aaggtgcagc tgcccctgtg gcccattttc aaggaagttt 660
gccggaagtt cccgcttaca acgcctcaga aaaataccca agcatgactt cagttaattc 720
tgcagaagcc agcactggtg caggaggggg gggcagtaat cctgtgaaaa gcatgtggag 780
tgagggggcc acttttagtg ccaactctgt aacttgtaca ttttccagac aatttttaat 840
tccatatgac ccagagcacc attataaggt gttttctccc gcagcaagta gctgccacaa 900
tgccagtgga aaggaggcaa aggtttgcac cattagtccc ataatgggat actcaacccc 960
atggagatat ttagatttta atgctttaaa tttatttttt tcacctttag agtttcagca 1020
cttaattgaa aattatggaa gtatagctcc tgatgcttta actgtaacca tatcagaaat 1080
tgctgttaag gatgttacgg acaaaactgg agggggggtg caggttactg acagcactac 1140
agggcgccta tgcatgttag tagaccatga atataagtac ccatatgtgt tagggcaagg 1200
tcaagatact ttagccccag aacttcctat ttgggtatac tttccccctc aatacgctta 1260
cttaacagta ggagatgtta acacacaagg aatttctgga gacagcaaaa aattggcaag 1320
tgaagaatca gcattttatg ttttggaaca cagttctttt cagcttttag gtacaggagg 1380
tacagcaact atgtcttata agtttcctcc agtgccccca gaaaatttag agggctgcag 1440
tcaacacttt tatgaaatgt acaacccctt atacggatcc cgcttagggg ttcctgacac 1500
attaggaggt gacccaaaat ttagatcttt aacacatgaa gaccatgcaa ttcagcccca 1560
aaacttcatg ccagggccac tagtaaactc agtgtctaca aaggagggag acagctctag 1620
tactggagct ggaaaagcct taacaggcct tagcacaggt acctctcaaa acactagaat 1680
atccttacgc cctgggccag tgtctcagcc gtaccaccac tgggacacag ataaatatgt 1740
cacaggaata aatgccattt ctcatggtca gaccacttat ggtaacgctg aagacaaaga 1800
gtatcagcaa ggagtgggta gatttccaaa tgaaaaagaa cagctaaaac agttacaggg 1860
tttaaacatg cacacctact ttcccaataa aggaacccag caatatacag atcaaattga 1920
gcgccccta atggtgggtt ctgtatggaa cagaagagcc cttcactatg aaagccagct 1980
gtggagtaaa attccaaatt tagatgacag ttttaaaact cagtttgcag ccttaggagg 2040
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atggggtttg catcagccac ctcctcaaat atttttaaaa atattaccac aaagtgggcc 2100
aattggaggt attaaatcaa tgggaattac taccttagtt cagtatgccg tgggaattat 2160
gacagtaacc atgacattta aattggggcc ccgtaaagct acgggacggt ggaatcctca 2220
acctggagtg tatcccccgc acgcagcagg tcatttacca tatgtactat atgaccccac 2280
agctacagat gcaaaacaac accacagaca tggatatgaa aagcctgaag aattgtggac 2340
agccaaaagc cgtgtgcacc cattgtaagt cgacatactc 2380

<210> 27
<211> 781
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VP1 amino acid from parvovirus B19 clone 2-B1

<400> 27
Met Ser Lys Glu Ser Gly Lys Trp Trp Glu Ser Asp Asp Lys Phe Ala
1 5 10 15

Lys Ala Val Tyr Gln Gln Phe Val Glu Phe Tyr Glu Lys Val Thr Gly
20 25 30

Thr Asp Leu Glu Leu Ile Gln Ile Leu Lys Asp His Tyr Asn Ile Ser
35 40 45

Leu Asp Asn Pro Leu Glu Asn Pro Ser Ser Leu Phe Asp Leu Val Ala
50 55 60

Arg Ile Lys Asn Asn Leu Lys Asn Ser Pro Asp Leu Tyr Ser His His
65 70 75 80

Phe Gln Ser His Gly Gln Leu Ser Asp His Pro His Ala Leu Ser Ser
85 90 95

Ser Ser Ser His Ala Glu Pro Arg Gly Glu Asp Ala Val Leu Ser Ser
100 105 110

Glu Asp Leu His Lys Pro Gly Gln Val Ser Val Gln Leu Pro Gly Thr
115 120 125

Asn Tyr Val Gly Pro Gly Asn Glu Leu Gln Ala Gly Pro Pro Gln Ser
130 135 140

Ala Val Asp Ser Ala Ala Arg Ile His Asp Phe Arg Tyr Ser Gln Leu
145 150 155 160

Ala Lys Leu Gly Ile Asn Pro Tyr Thr His Trp Thr Val Ala Asp Glu
165 170 175

Glu Leu Leu Lys Asn Ile Lys Asn Glu Thr Gly Phe Gln Ala Gln Val
180 185 190

Val Lys Asp Tyr Phe Thr Leu Lys Gly Ala Ala Ala Pro Val Ala His
195 200 205

Phe Gln Gly Ser Leu Pro Glu Val Pro Ala Tyr Asn Ala Ser Glu Lys
210 215 220

Tyr Pro Ser Met Thr Ser Val Asn Ser Ala Glu Ala Ser Thr Gly Ala
225 230 235 240

Gly Gly Gly Gly Ser Asn Pro Val Lys Ser Met Trp Ser Glu Gly Ala

245 250 255

Thr Phe Ser Ala Asn Ser Val Thr Cys Thr Phe Ser Arg Gln Phe Leu
260 265 270

Ile Pro Tyr Asp Pro Glu His His Tyr Lys Val Phe Ser Pro Ala Ala
275 280 285

Ser Ser Cys His Asn Ala Ser Gly Lys Glu Ala Lys Val Cys Thr Ile
290 295 300

Ser Pro Ile Met Gly Tyr Ser Thr Pro Trp Arg Tyr Leu Asp Phe Asn
305 310 315 320

Ala Leu Asn Leu Phe Phe Ser Pro Leu Glu Phe Gln His Leu Ile Glu
325 330 335

Asn Tyr Gly Ser Ile Ala Pro Asp Ala Leu Thr Val Thr Ile Ser Glu
340 345 350

Ile Ala Val Lys Asp Val Thr Asp Lys Thr Gly Gly Gly Val Gln Val
355 360 365

Thr Asp Ser Thr Thr Gly Arg Leu Cys Met Leu Val Asp His Glu Tyr
370 375 380

Lys Tyr Pro Tyr Val Leu Gly Gln Gly Gln Asp Thr Leu Ala Pro Glu
385 390 395 400

Leu Pro Ile Trp Val Tyr Phe Pro Pro Gln Tyr Ala Tyr Leu Thr Val
405 410 415

Gly Asp Val Asn Thr Gln Gly Ile Ser Gly Asp Ser Lys Lys Leu Ala
420 425 430

Ser Glu Glu Ser Ala Phe Tyr Val Leu Glu His Ser Ser Phe Gln Leu
435 440 445

Leu Gly Thr Gly Gly Thr Ala Thr Met Ser Tyr Lys Phe Pro Pro Val
450 455 460

Pro Pro Glu Asn Leu Glu Gly Cys Ser Gln His Phe Tyr Glu Met Tyr
465 470 475 480

Asn Pro Leu Tyr Gly Ser Arg Leu Gly Val Pro Asp Thr Leu Gly Gly
485 490 495

Asp Pro Lys Phe Arg Ser Leu Thr His Glu Asp His Ala Ile Gln Pro
500 505 510

Gln Asn Phe Met Pro Gly Pro Leu Val Asn Ser Val Ser Thr Lys Glu
515 520 525

Gly Asp Ser Ser Ser Thr Gly Ala Gly Lys Ala Leu Thr Gly Leu Ser
530 535 540

Thr Gly Thr Ser Gln Asn Thr Arg Ile Ser Leu Arg Pro Gly Pro Val
545 550 555 560

Ser Gln Pro Tyr His His Trp Asp Thr Asp Lys Tyr Val Thr Gly Ile
565 570 575

Asn Ala Ile Ser His Gly Gln Thr Thr Tyr Gly Asn Ala Glu Asp Lys

```
            580                 585                 590

Glu Tyr Gln Gln Gly Val Gly Arg Phe Pro Asn Glu Lys Glu Gln Leu
        595                 600                 605

Lys Gln Leu Gln Gly Leu Asn Met His Thr Tyr Phe Pro Asn Lys Gly
    610                 615                 620

Thr Gln Gln Tyr Thr Asp Gln Ile Glu Arg Pro Leu Met Val Gly Ser
625                 630                 635                 640

Val Trp Asn Arg Arg Ala Leu His Tyr Glu Ser Gln Leu Trp Ser Lys
                645                 650                 655

Ile Pro Asn Leu Asp Asp Ser Phe Lys Thr Gln Phe Ala Ala Leu Gly
            660                 665                 670

Gly Trp Gly Leu His Gln Pro Pro Pro Gln Ile Phe Leu Lys Ile Leu
        675                 680                 685

Pro Gln Ser Gly Pro Ile Gly Gly Ile Lys Ser Met Gly Ile Thr Thr
    690                 695                 700

Leu Val Gln Tyr Ala Val Gly Ile Met Thr Val Thr Met Thr Phe Lys
705                 710                 715                 720

Leu Gly Pro Arg Lys Ala Thr Gly Arg Trp Asn Pro Gln Pro Gly Val
                725                 730                 735

Tyr Pro Pro His Ala Ala Gly His Leu Pro Tyr Val Leu Tyr Asp Pro
            740                 745                 750

Thr Ala Thr Asp Ala Lys Gln His His Arg His Gly Tyr Glu Lys Pro
        755                 760                 765

Glu Glu Leu Trp Thr Ala Lys Ser Arg Val His Pro Leu
    770                 775                 780
```

<210> 28
<211> 1699
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VP2 from parvovirus B19 clone 2-B1

<400> 28

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atactcaagc ttacaaaaca aaatgacttc agttaattct gcagaagcca gcactggtgc 60
aggaggggag ggcagtaatc ctgtgaaaag catgtggagt gaggggggca cttttagtgc 120
caactctgta acttgtacat tttccagaca atttttaatt ccatatgacc cagagcacca 180
ttataaggtg ttttctcccg cagcaagtag ctgccacaat gccagtggaa aggaggcaaa 240
ggtttgcacc attagtccca taatgggata ctcaacccca tggagatatt tagattttaa 300
tgctttaaat ttatttttt caccttaga gtttcagcac ttaattgaaa attatggaag 360
tatagctcct gatgctttaa ctgtaaccat atcagaaatt gctgttaagg atgttacgga 420
caaaactgga gggggggtgc aggttactga cagcactaca gggcgcctat gcatgttagt 480
agaccatgaa tataagtacc catatgtgtt agggcaaggt caagatactt tagccccaga 540
acttcctatt tgggtatact ttccccctca atacgcttac ttaacagtag gagatgttaa 600
cacacaagga atttctggag acagcaaaaa attggcaagt gaagaatcag cattttatgt 660
tttggaacac agttcttttc agcttttagg tacaggaggt acagcaacta tgtcttataa 720
gtttcctcca gtgccccccag aaaatttaga gggctgcagt caacactttt atgaaatgta 780
caaccccctta tacggatccc gcttaggggt tcctgacaca ttaggaggtg acccaaaatt 840
```

tagatcttta acacatgaag accatgcaat tcagccccaa aacttcatgc cagggccact 900
agtaaactca gtgtctacaa aggagggaga cagctctagt actggagctg gaaaagcctt 960
aacaggcctt agcacaggta cctctcaaaa cactagaata tccttacgcc ctgggccagt 1020
gtctcagccg taccaccact gggacacaga taaatatgtc acaggaataa atgccatttc 1080
tcatggtcag accacttatg gtaacgctga agacaaagag tatcagcaag gagtgggtag 1140
atttccaaat gaaaaagaac agctaaaaca gttacagggt ttaaacatgc acacctactt 1200
tcccaataaa ggaacccagc aatatacaga tcaaattgag cgccccctaa tggtgggttc 1260
tgtatggaac agaagagccc ttcactatga aagccagctg tggagtaaaa ttccaaattt 1320
agatgacagt tttaaaactc agtttgcagc cttaggagga tggggtttgc atcagccacc 1380
tcctcaaata tttttaaaaa tattaccaca aagtgggcca attggaggta ttaaatcaat 1440
gggaattact accttagttc agtatgccgt gggaattatg acagtaacca tgacatttaa 1500
attggggccc cgtaaagcta cgggacggtg gaatcctcaa cctggagtgt atcccccgca 1560
cgcagcaggt catttaccat atgtactata tgaccccaca gctacagatg caaaacaaca 1620
ccacagacat ggatatgaaa agcctgaaga attgtggaca gccaaaagcc gtgtgcaccc 1680
attgtaagtc gacatactc 1699

<210> 29
<211> 554
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VP2 amino acid from parvovirus B19 clone 2-B1

<400> 29
Met Thr Ser Val Asn Ser Ala Glu Ala Ser Thr Gly Ala Gly Gly Gly
1 5 10 15

Gly Ser Asn Pro Val Lys Ser Met Trp Ser Glu Gly Ala Thr Phe Ser
20 25 30

Ala Asn Ser Val Thr Cys Thr Phe Ser Arg Gln Phe Leu Ile Pro Tyr
35 40 45

Asp Pro Glu His His Tyr Lys Val Phe Ser Pro Ala Ala Ser Ser Cys
50 55 60

His Asn Ala Ser Gly Lys Glu Ala Lys Val Cys Thr Ile Ser Pro Ile
65 70 75 80

Met Gly Tyr Ser Thr Pro Trp Arg Tyr Leu Asp Phe Asn Ala Leu Asn
85 90 95

Leu Phe Phe Ser Pro Leu Glu Phe Gln His Leu Ile Glu Asn Tyr Gly
100 105 110

Ser Ile Ala Pro Asp Ala Leu Thr Val Thr Ile Ser Glu Ile Ala Val
115 120 125

Lys Asp Val Thr Asp Lys Thr Gly Gly Gly Val Gln Val Thr Asp Ser
130 135 140

Thr Thr Gly Arg Leu Cys Met Leu Val Asp His Glu Tyr Lys Tyr Pro
145 150 155 160

Tyr Val Leu Gly Gln Gly Gln Asp Thr Leu Ala Pro Glu Leu Pro Ile
165 170 175

Trp Val Tyr Phe Pro Pro Gln Tyr Ala Tyr Leu Thr Val Gly Asp Val
180 185 190

Asn Thr Gln Gly Ile Ser Gly Asp Ser Lys Lys Leu Ala Ser Glu Glu

```
        195                 200                 205

Ser Ala Phe Tyr Val Leu Glu His Ser Ser Phe Gln Leu Leu Gly Thr
    210                 215                 220

Gly Gly Thr Ala Thr Met Ser Tyr Lys Phe Pro Pro Val Pro Pro Glu
225                 230                 235                 240

Asn Leu Glu Gly Cys Ser Gln His Phe Tyr Glu Met Tyr Asn Pro Leu
                245                 250                 255

Tyr Gly Ser Arg Leu Gly Val Pro Asp Thr Leu Gly Gly Asp Pro Lys
            260                 265                 270

Phe Arg Ser Leu Thr His Glu Asp His Ala Ile Gln Pro Gln Asn Phe
        275                 280                 285

Met Pro Gly Pro Leu Val Asn Ser Val Ser Thr Lys Glu Gly Asp Ser
    290                 295                 300

Ser Ser Thr Gly Ala Gly Lys Ala Leu Thr Gly Leu Ser Thr Gly Thr
305                 310                 315                 320

Ser Gln Asn Thr Arg Ile Ser Leu Arg Pro Gly Pro Val Ser Gln Pro
                325                 330                 335

Tyr His His Trp Asp Thr Asp Lys Tyr Val Thr Gly Ile Asn Ala Ile
            340                 345                 350

Ser His Gly Gln Thr Thr Tyr Gly Asn Ala Glu Asp Lys Glu Tyr Gln
        355                 360                 365

Gln Gly Val Gly Arg Phe Pro Asn Glu Lys Glu Gln Leu Lys Gln Leu
    370                 375                 380

Gln Gly Leu Asn Met His Thr Tyr Phe Pro Asn Lys Gly Thr Gln Gln
385                 390                 395                 400

Tyr Thr Asp Gln Ile Glu Arg Pro Leu Met Val Gly Ser Val Trp Asn
                405                 410                 415

Arg Arg Ala Leu His Tyr Glu Ser Gln Leu Trp Ser Lys Ile Pro Asn
            420                 425                 430

Leu Asp Asp Ser Phe Lys Thr Gln Phe Ala Ala Leu Gly Gly Trp Gly
        435                 440                 445

Leu His Gln Pro Pro Pro Gln Ile Phe Leu Lys Ile Leu Pro Gln Ser
    450                 455                 460

Gly Pro Ile Gly Gly Ile Lys Ser Met Gly Ile Thr Thr Leu Val Gln
465                 470                 475                 480

Tyr Ala Val Gly Ile Met Thr Val Thr Met Thr Phe Lys Leu Gly Pro
                485                 490                 495

Arg Lys Ala Thr Gly Arg Trp Asn Pro Gln Pro Gly Val Tyr Pro Pro
            500                 505                 510

His Ala Ala Gly His Leu Pro Tyr Val Leu Tyr Asp Pro Thr Ala Thr
        515                 520                 525

Asp Ala Lys Gln His His Arg His Gly Tyr Glu Lys Pro Glu Glu Leu
```

530 535 540

Trp Thr Ala Lys Ser Arg Val His Pro Leu
545 550

<210> 30
<211> 2049
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: NS1 from parvovirus B19 clone 2-B6

<400> 30
atactcttcg aacaaaacaa aatggagcta tttagagggg tgcttcaagt ttcttctaat 60
gttctggact gtgctaacga taactggtgg tgctctttac tggatttaga cacttctgac 120
tgggaaccac taactcatac taacagacta atggcaatat acttaagcag tgtggcttct 180
aagcttgact ttactggggg gccactagca gggtgcttgt actttttca agtagaatgt 240
aacaaatttg aagaaggcta tcatattcat gtggttattg gggggccagg gttaaacccc 300
agaaacctca cagtgtgtgt agaggggtta tttaataatg tactttatca ccttgtaact 360
gaaaatctga agctaaaatt tttgccagga atgactacaa aaggcaaata ctttagagat 420
ggagagcagt ttatagaaaa ctatttaatg aaaaaaatac ctttaaatgt tgtatggtgt 480
gttactaata ttgatggaca tatagatacc tgtatttctg ctacttttag aaagggagct 540
tgccatgcca agaaaccccg catcaccaca gccataaatg atactagtac tgatgctggg 600
gagtctagcg gcacaggggc agaggttgtg ccatttaatg ggaagggaac taaggctagc 660
ataaagtttc aaactatggt aaactggttg tgtgaaaaca gagtgtttac agaggataag 720
tggaaactag ttgactttaa ccagtacact ttactaagca gtagtcacag tggaagtttt 780
caaattcaaa gtgcactaaa actagcaatt tataaagcaa ctaatttagt gcctactagc 840
acatttttat tgcatacaga ctttgagcaa gttatgtgta ttaaagacaa taaaattgtt 900
aaattgttac tttgtcaaaa ctatgacccc ctattagtgg ggcagcatgt gttaaagtgg 960
attgataaaa aatgtggcaa gaaaaacaca ctgtggtttt atggaccgcc aagtacaggg 1020
aaaacaaact tggcaatggc cattgctaaa agtgttccag tatatggcat ggttaactgg 1080
aataatgaaa actttccatt taatgatgta gcaggaaaaa gcttggtggt ctgggatgaa 1140
ggtattatta agtctacaat tgtagaagct gcaaaagcca ttttaggcgg gcaacccacc 1200
agggtagatc aaaaaatgcg tggaagtgta gctgtgcctg gagtacccgt ggttataacc 1260
agcaatggtg acattacttt tgttgtaagc gggaacacta caacaactgt acatgctaaa 1320
gccttaaaag agcgcatggt aaagttaaac tttactgtaa gatgcagccc tgacatgggg 1380
ttactaacag aggctgatgt acaacagtgg cttacatggt gtaatgcaca aagctgggac 1440
cactatgaaa actgggcaat aaactacact tttgatttcc ctggaattaa tgcagatgcc 1500
ctccacccag acctccaaac caccccaatt gtcacagaca ccagtatcag cagcagtggt 1560
ggtgaaagct ctgaagaact cagtgaaagc agcttttta acctcatcac cccaggcgcc 1620
tggaacactg aaaccccgcg ctctagtacg cccatccccg ggaccagttc aggagaatca 1680
tctgtcggaa gcccagtttc ctccgaagtt gtagctgcat cgtgggaaga agccttctac 1740
acacctttgg cagaccagtt tcgtgaactg ttagttgggg ttgattatgt gtgggacggt 1800
gtaaggggtt tacctgtctg ttgtgtgcaa catattaaca atagtggggg aggcttggga 1860
ctttgtcccc attgcattaa tgtaggggct tggtataatg gatggaaatt tcgagaattt 1920
accccagatt tggtgcgatg tagctgccat gtgggagctt ctaatccctt ttctgtgcta 1980
acctgcaaaa aatgtgctta cctgtctgga ttgcaaagct ttgtagatta tgagtaagtc 2040
gacatactc 2049

<210> 31
<211> 671
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: NS1 amino acid from parvovirus B19 clone 2-B6

<400> 31
Met Glu Leu Phe Arg Gly Val Leu Gln Val Ser Ser Asn Val Leu Asp

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1               5                  10                  15

Cys Ala Asn Asp Asn Trp Trp Cys Ser Leu Leu Asp Leu Asp Thr Ser
            20                  25                  30

Asp Trp Glu Pro Leu Thr His Thr Asn Arg Leu Met Ala Ile Tyr Leu
        35                  40                  45

Ser Ser Val Ala Ser Lys Leu Asp Phe Thr Gly Gly Pro Leu Ala Gly
    50                  55                  60

Cys Leu Tyr Phe Phe Gln Val Glu Cys Asn Lys Phe Glu Glu Gly Tyr
65                  70                  75                  80

His Ile His Val Val Ile Gly Gly Pro Gly Leu Asn Pro Arg Asn Leu
                85                  90                  95

Thr Val Cys Val Glu Gly Leu Phe Asn Asn Val Leu Tyr His Leu Val
            100                 105                 110

Thr Glu Asn Leu Lys Leu Lys Phe Leu Pro Gly Met Thr Thr Lys Gly
        115                 120                 125

Lys Tyr Phe Arg Asp Gly Glu Gln Phe Ile Glu Asn Tyr Leu Met Lys
    130                 135                 140

Lys Ile Pro Leu Asn Val Val Trp Cys Val Thr Asn Ile Asp Gly His
145                 150                 155                 160

Ile Asp Thr Cys Ile Ser Ala Thr Phe Arg Lys Gly Ala Cys His Ala
                165                 170                 175

Lys Lys Pro Arg Ile Thr Thr Ala Ile Asn Asp Thr Ser Thr Asp Ala
            180                 185                 190

Gly Glu Ser Ser Gly Thr Gly Ala Glu Val Val Pro Phe Asn Gly Lys
        195                 200                 205

Gly Thr Lys Ala Ser Ile Lys Phe Gln Thr Met Val Asn Trp Leu Cys
    210                 215                 220

Glu Asn Arg Val Phe Thr Glu Asp Lys Trp Lys Leu Val Asp Phe Asn
225                 230                 235                 240

Gln Tyr Thr Leu Leu Ser Ser Ser His Ser Gly Ser Phe Gln Ile Gln
                245                 250                 255

Ser Ala Leu Lys Leu Ala Ile Tyr Lys Ala Thr Asn Leu Val Pro Thr
            260                 265                 270

Ser Thr Phe Leu Leu His Thr Asp Phe Glu Gln Val Met Cys Ile Lys
        275                 280                 285

Asp Asn Lys Ile Val Lys Leu Leu Leu Cys Gln Asn Tyr Asp Pro Leu
    290                 295                 300

Leu Val Gly Gln His Val Leu Lys Trp Ile Asp Lys Lys Cys Gly Lys
305                 310                 315                 320

Lys Asn Thr Leu Trp Phe Tyr Gly Pro Pro Ser Thr Gly Lys Thr Asn
                325                 330                 335

Leu Ala Met Ala Ile Ala Lys Ser Val Pro Val Tyr Gly Met Val Asn
```

340 345 350

Trp Asn Asn Glu Asn Phe Pro Phe Asn Asp Val Ala Gly Lys Ser Leu
355 360 365

Val Val Trp Asp Glu Gly Ile Ile Lys Ser Thr Ile Val Glu Ala Ala
370 375 380

Lys Ala Ile Leu Gly Gly Gln Pro Thr Arg Val Asp Gln Lys Met Arg
385 390 395 400

Gly Ser Val Ala Val Pro Gly Val Pro Val Val Ile Thr Ser Asn Gly
405 410 415

Asp Ile Thr Phe Val Val Ser Gly Asn Thr Thr Thr Thr Val His Ala
420 425 430

Lys Ala Leu Lys Glu Arg Met Val Lys Leu Asn Phe Thr Val Arg Cys
435 440 445

Ser Pro Asp Met Gly Leu Leu Thr Glu Ala Asp Val Gln Gln Trp Leu
450 455 460

Thr Trp Cys Asn Ala Gln Ser Trp Asp His Tyr Glu Asn Trp Ala Ile
465 470 475 480

Asn Tyr Thr Phe Asp Phe Pro Gly Ile Asn Ala Asp Ala Leu His Pro
485 490 495

Asp Leu Gln Thr Thr Pro Ile Val Thr Asp Thr Ser Ile Ser Ser Ser
500 505 510

Gly Gly Glu Ser Ser Glu Glu Leu Ser Glu Ser Ser Phe Phe Asn Leu
515 520 525

Ile Thr Pro Gly Ala Trp Asn Thr Glu Thr Pro Arg Ser Ser Thr Pro
530 535 540

Ile Pro Gly Thr Ser Ser Gly Glu Ser Ser Val Gly Ser Pro Val Ser
545 550 555 560

Ser Glu Val Val Ala Ala Ser Trp Glu Glu Ala Phe Tyr Thr Pro Leu
565 570 575

Ala Asp Gln Phe Arg Glu Leu Leu Val Gly Val Asp Tyr Val Trp Asp
580 585 590

Gly Val Arg Gly Leu Pro Val Cys Cys Val Gln His Ile Asn Asn Ser
595 600 605

Gly Gly Gly Leu Gly Leu Cys Pro His Cys Ile Asn Val Gly Ala Trp
610 615 620

Tyr Asn Gly Trp Lys Phe Arg Glu Phe Thr Pro Asp Leu Val Arg Cys
625 630 635 640

Ser Cys His Val Gly Ala Ser Asn Pro Phe Ser Val Leu Thr Cys Lys
645 650 655

Lys Cys Ala Tyr Leu Ser Gly Leu Gln Ser Phe Val Asp Tyr Glu
660 665 670

<210> 32
<211> 2380
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VP1 from
parvovirus B19 clone 2-B6

<400> 32
atactcaagc ttacaaaaca aaatgagtaa agaaagtggc aaatggtggg aaagtgatga 60
taaatttgct aaagctgtgt atcagcaatt tgtggaattt tatgaaaagg ttactggaac 120
agacttagag cttattcaaa tattaaaaga tcattataat atttctttag ataatccccc 180
agaaaaccca tcctctttgt ttgacttagt tgctcgtatt aaaaataacc ttaaaaactc 240
tccagactta tatagtcatc attttcaaag tcatggacag ttatctgacc acccccatgc 300
cttatcatcc agtagcagtc atgcagaacc tagaggagaa gatgcagtat tatctagtga 360
agacttacac aagcctgggc aagttagcgt acaactaccc ggtactaact atgttgggcc 420
tggcaatgag ctacaagctg ggcccccgca aagtgctgtt gacagtgctg caaggattca 480
tgactttagg tatagccaac tggctaagtt gggaataaat ccatatactc attggactgt 540
agcagatgaa gagcttttaa aaaatataaa aaatgaaact gggtttcaag cacaagtagt 600
aaaagactac tttactttaa aaggtgcagc tgcccctgtg gcccattttc aaggaagttt 660
gccggaagtt cccgcttaca acgcctcaga aaaataccca agcatgactt cagttaattc 720
tgcagaagcc agcactggtg caggaggggg gggcagtaat cctgtgaaaa gcatgtggag 780
tgaggggccc acttttagtg ccaactctgt aacttgtaca ttttccagac aatttttaat 840
tccatatgac ccagagcacc attataaggt gttttctccc gcagcaagta gctgccacaa 900
tgccagtgga aaggaggcaa aggtttgcac cattagtccc ataatgggat actcaacccc 960
atggagatat ttagatttta atgctttaaa tttatttttt tcacctttag agtttcagca 1020
cttaattgaa aattatggaa gtatagctcc tgatgcttta actgtaacca tatcagaaat 1080
tgctgttaag gatgttacaa acaaaactgg agggggggtg caggttactg acagcactac 1140
agggcgccta tgcatgttag tagaccatga atataagtac ccatatgtgt tagggcaagg 1200
tcaagatact ttagccccag aacttcctat ttgggtatac tttccccctc aatacgctta 1260
cttaacagta ggagatgtta acacacaagg aatttctgga gacagcaaaa aattggcaag 1320
tgaagaatca gcattttatg ttttggaaca cagttctttt cagcttttag gtacaggagg 1380
tacagcaact atgtcttata agtttcctcc agtgccccca gaaaatttag agggctgcag 1440
tcaacacttt tatgaaatgt acaaccccct atacggatcc cgcttagggg ttcctgacac 1500
attaggaggt gacccaaaat ttagatcttt aacacatgaa gaccatgcaa ttcagcccca 1560
aaacttcatg ccagggccac tagtaaactc agtgtctaca aaggagggag acagctctag 1620
tactggagct ggaaaagcct taacaggcct tagcacaggt acctctcaaa acactagaat 1680
atccttacgc cctgggccag tgtctcagcc gtaccaccac tgggacacag ataaatatgt 1740
cacaggaata aatgccattt ctcatggtca gaccacttat ggtaacgctg aagacaaaga 1800
gtatcagcaa ggagtgggta gatttccaaa tgaaaaagaa cagctaaaac agttacaggg 1860
tttaaacatg cacacctact ttcccaataa aggaacccag caatatacag atcaaattga 1920
gcgcccccta atggtgggtt ctgtatggaa cagaagagcc cttcactatg aaagccagct 1980
gtggagtaaa attccaaatt tagatgacag ttttaaaact cagtttgcag ccttaggagg 2040
atggggtttg catcagccac ctcctcaaat attcttaaaa atattaccac aaagtgggcc 2100
aattggaggt attaaatcaa tgggaattac taccttagtt cagtatgccg tgggaattat 2160
gacagtaacc atgacattta aattggggcc ccgtaaagct acgggacggt ggaatcctca 2220
acctggagtg tatcccccgc acgcagcagg tcatttacca tatgtactat atgaccccac 2280
agctacagat gcaaaacaac accacagaca tggatatgaa aagcctgaag aattgtggac 2340
agccaaaagc cgtgtgcacc cattgtaagt cgacatactc 2380

<210> 33
<211> 781
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VP1 amino acid from
parvovirus B19 clone 2-B6

<400> 33
Met Ser Lys Glu Ser Gly Lys Trp Trp Glu Ser Asp Asp Lys Phe Ala
1 5 10 15

```
Lys Ala Val Tyr Gln Gln Phe Val Glu Phe Tyr Glu Lys Val Thr Gly
                20                  25                  30

Thr Asp Leu Glu Leu Ile Gln Ile Leu Lys Asp His Tyr Asn Ile Ser
            35                  40                  45

Leu Asp Asn Pro Leu Glu Asn Pro Ser Ser Leu Phe Asp Leu Val Ala
        50                  55                  60

Arg Ile Lys Asn Asn Leu Lys Asn Ser Pro Asp Leu Tyr Ser His His
65                  70                  75                  80

Phe Gln Ser His Gly Gln Leu Ser Asp His Pro His Ala Leu Ser Ser
                85                  90                  95

Ser Ser Ser His Ala Glu Pro Arg Gly Glu Asp Ala Val Leu Ser Ser
            100                 105                 110

Glu Asp Leu His Lys Pro Gly Gln Val Ser Val Gln Leu Pro Gly Thr
        115                 120                 125

Asn Tyr Val Gly Pro Gly Asn Glu Leu Gln Ala Gly Pro Pro Gln Ser
    130                 135                 140

Ala Val Asp Ser Ala Ala Arg Ile His Asp Phe Arg Tyr Ser Gln Leu
145                 150                 155                 160

Ala Lys Leu Gly Ile Asn Pro Tyr Thr His Trp Thr Val Ala Asp Glu
                165                 170                 175

Glu Leu Leu Lys Asn Ile Lys Asn Glu Thr Gly Phe Gln Ala Gln Val
            180                 185                 190

Val Lys Asp Tyr Phe Thr Leu Lys Gly Ala Ala Ala Pro Val Ala His
        195                 200                 205

Phe Gln Gly Ser Leu Pro Glu Val Pro Ala Tyr Asn Ala Ser Glu Lys
    210                 215                 220

Tyr Pro Ser Met Thr Ser Val Asn Ser Ala Glu Ala Ser Thr Gly Ala
225                 230                 235                 240

Gly Gly Gly Gly Ser Asn Pro Val Lys Ser Met Trp Ser Glu Gly Ala
                245                 250                 255

Thr Phe Ser Ala Asn Ser Val Thr Cys Thr Phe Ser Arg Gln Phe Leu
            260                 265                 270

Ile Pro Tyr Asp Pro Glu His His Tyr Lys Val Phe Ser Pro Ala Ala
        275                 280                 285

Ser Ser Cys His Asn Ala Ser Gly Lys Glu Ala Lys Val Cys Thr Ile
    290                 295                 300

Ser Pro Ile Met Gly Tyr Ser Thr Pro Trp Arg Tyr Leu Asp Phe Asn
305                 310                 315                 320

Ala Leu Asn Leu Phe Glu Ser Pro Leu Glu Phe Gln His Leu Ile Glu
                325                 330                 335

Asn Tyr Gly Ser Ile Ala Pro Asp Ala Leu Thr Val Thr Ile Ser Glu
            340                 345                 350
```

```
Ile Ala Val Lys Asp Val Thr Asn Lys Thr Gly Gly Gly Val Gln Val
        355                 360                 365

Thr Asp Ser Thr Thr Gly Arg Leu Cys Met Leu Val Asp His Glu Tyr
    370                 375                 380

Lys Tyr Pro Tyr Val Leu Gly Gln Gly Gln Asp Thr Leu Ala Pro Glu
385                 390                 395                 400

Leu Pro Ile Trp Val Tyr Phe Pro Pro Gln Tyr Ala Tyr Leu Thr Val
                405                 410                 415

Gly Asp Val Asn Thr Gln Gly Ile Ser Gly Asp Ser Lys Lys Leu Ala
            420                 425                 430

Ser Glu Glu Ser Ala Phe Tyr Val Leu Glu His Ser Ser Phe Gln Leu
        435                 440                 445

Leu Gly Thr Gly Gly Thr Ala Thr Met Ser Tyr Lys Phe Pro Pro Val
    450                 455                 460

Pro Pro Glu Asn Leu Glu Gly Cys Ser Gln His Phe Tyr Glu Met Tyr
465                 470                 475                 480

Asn Pro Leu Tyr Gly Ser Arg Leu Gly Val Pro Asp Thr Leu Gly Gly
                485                 490                 495

Asp Pro Lys Phe Arg Ser Leu Thr His Glu Asp His Ala Ile Gln Pro
            500                 505                 510

Gln Asn Phe Met Pro Gly Pro Leu Val Asn Ser Val Ser Thr Lys Glu
        515                 520                 525

Gly Asp Ser Ser Ser Thr Gly Ala Gly Lys Ala Leu Thr Gly Leu Ser
    530                 535                 540

Thr Gly Thr Ser Gln Asn Thr Arg Ile Ser Leu Arg Pro Gly Pro Val
545                 550                 555                 560

Ser Gln Pro Tyr His His Trp Asp Thr Asp Lys Tyr Val Thr Gly Ile
                565                 570                 575

Asn Ala Ile Ser His Gly Gln Thr Thr Tyr Gly Asn Ala Glu Asp Lys
            580                 585                 590

Glu Tyr Gln Gln Gly Val Gly Arg Phe Pro Asn Glu Lys Glu Gln Leu
        595                 600                 605

Lys Gln Leu Gln Gly Leu Asn Met His Thr Tyr Phe Pro Asn Lys Gly
    610                 615                 620

Thr Gln Gln Tyr Thr Asp Gln Ile Glu Arg Pro Leu Met Val Gly Ser
625                 630                 635                 640

Val Trp Asn Arg Arg Ala Leu His Tyr Glu Ser Gln Leu Trp Ser Lys
                645                 650                 655

Ile Pro Asn Leu Asp Asp Ser Phe Lys Thr Gln Phe Ala Ala Leu Gly
            660                 665                 670

Gly Trp Gly Leu His Gln Pro Pro Pro Gln Ile Phe Leu Lys Ile Leu
        675                 680                 685
```

```
Pro Gln Ser Gly Pro Ile Gly Gly Ile Lys Ser Met Gly Ile Thr Thr
    690                 695                 700

Leu Val Gln Tyr Ala Val Gly Ile Met Thr Val Thr Met Thr Phe Lys
705                 710                 715                 720

Leu Gly Pro Arg Lys Ala Thr Gly Arg Trp Asn Pro Gln Pro Gly Val
                725                 730                 735

Tyr Pro Pro His Ala Ala Gly His Leu Pro Tyr Val Leu Tyr Asp Pro
            740                 745                 750

Thr Ala Thr Asp Ala Lys Gln His His Arg His Gly Tyr Glu Lys Pro
        755                 760                 765

Glu Glu Leu Trp Thr Ala Lys Ser Arg Val His Pro Leu
    770                 775                 780
```

<210> 34
<211> 1699
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VP2 from parvovirus B19 clone 2-B6

<400> 34

```
atactcaagc ttacaaaaca aaatgacttc agttaattct gcagaagcca gcactggtgc 60
aggaggggag ggcagtaatc ctgtgaaaag catgtggagt gaggggggca cttttagtgc 120
caactctgta acttgtacat tttccagaca atttttaatt ccatatgacc cagagcacca 180
ttataaggtg ttttctcccg cagcaagtag ctgccacaat gccagtggaa aggaggcaaa 240
ggtttgcacc attagtccca taatgggata ctcaacccca tggagatatt tagattttaa 300
tgctttaaat ttatttttt caccttttaga gtttcagcac ttaattgaaa attatggaag 360
tatagctcct gatgctttaa ctgtaaccat atcagaaatt gctgttaagg atgttacaaa 420
caaaactgga gggggggtgc aggttactga cagcactaca gggcgcctat gcatgttagt 480
agaccatgaa tataagtacc catatgtgtt agggcaaggt caagatactt tagccccaga 540
acttcctatt tgggtatact ttccccctca atacgcttac ttaacagtag gagatgttaa 600
cacacaagga atttctggag acagcaaaaa attggcaagt gaagaatcag cattttatgt 660
tttggaacac agttcttttc agcttttagg tacaggaggt acagcaacta tgtcttataa 720
gtttcctcca gtgccccccag aaaatttaga gggctgcagt caacactttt atgaaatgta 780
caacccctta tacggatccc gcttaggggt tcctgacaca ttaggaggtg acccaaaatt 840
tagatcttta acacatgaag accatgcaat tcagccccaa aacttcatgc cagggccact 900
agtaaactca gtgtctacaa aggagggaga cagctctagt actggagctg gaaaagcctt 960
aacaggcctt agcacaggta cctctcaaaa cactagaata tccttacgcc ctgggccagt 1020
gtctcagccg taccaccact gggacacaga taaatatgtc acaggaataa atgccatttc 1080
tcatggtcag accacttatg gtaacgctga agacaaagag tatcagcaag gagtgggtag 1140
atttccaaat gaaaaagaac agctaaaaca gttacagggt ttaaacatgc acacctactt 1200
tcccaataaa ggaacccagc aatatacaga tcaaattgag cgccccctaa tggtgggttc 1260
tgtatggaac agaagagccc ttcactatga aagccagctg tggagtaaaa ttccaaattt 1320
agatgacagt tttaaaactc agtttgcagc cttaggagga tggggtttgc atcagccacc 1380
tcctcaaata tttttaaaaa tattaccaca aagtgggcca attggaggta ttaaatcaat 1440
gggaattact accttagttc agtatgccgt gggaattatg acagtaacca tgacatttaa 1500
attggggccc cgtaaagcta cgggacggtg gaatcctcaa cctggagtgt atcccccgca 1560
cgcagcaggt catttaccat atgtactata tgaccccaca gctacagatg caaaacaaca 1620
ccacagacat ggatatgaaa agcctgaaga attgtggaca gccaaaagcc gtgtgcaccc 1680
attgtaagtc gacatactc                                          1699
```

<210> 35
<211> 554
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VP2 amino acid from parvovirus B19 clone 2-B6

<400> 35

```
Met Thr Ser Val Asn Ser Ala Glu Ala Ser Thr Gly Ala Gly Gly Gly
 1               5                  10                  15

Gly Ser Asn Pro Val Lys Ser Met Trp Ser Glu Gly Ala Thr Phe Ser
            20                  25                  30

Ala Asn Ser Val Thr Cys Thr Phe Ser Arg Gln Phe Leu Ile Pro Tyr
        35                  40                  45

Asp Pro Glu His His Tyr Lys Val Phe Ser Pro Ala Ala Ser Ser Cys
    50                  55                  60

His Asn Ala Ser Gly Lys Glu Ala Lys Val Cys Thr Ile Ser Pro Ile
65                  70                  75                  80

Met Gly Tyr Ser Thr Pro Trp Arg Tyr Leu Asp Phe Asn Ala Leu Asn
                85                  90                  95

Leu Phe Phe Ser Pro Leu Glu Phe Gln His Leu Ile Glu Asn Tyr Gly
            100                 105                 110

Ser Ile Ala Pro Asp Ala Leu Thr Val Thr Ile Ser Glu Ile Ala Val
        115                 120                 125

Lys Asp Val Thr Asn Lys Thr Gly Gly Gly Val Gln Val Thr Asp Ser
    130                 135                 140

Thr Thr Gly Arg Leu Cys Met Leu Val Asp His Glu Tyr Lys Tyr Pro
145                 150                 155                 160

Tyr Val Leu Gly Gln Gly Gln Asp Thr Leu Ala Pro Glu Leu Pro Ile
                165                 170                 175

Trp Val Tyr Phe Pro Pro Gln Tyr Ala Tyr Leu Thr Val Gly Asp Val
            180                 185                 190

Asn Thr Gln Gly Ile Ser Gly Asp Ser Lys Lys Leu Ala Ser Glu Glu
        195                 200                 205

Ser Ala Phe Tyr Val Leu Glu His Ser Ser Phe Gln Leu Leu Gly Thr
    210                 215                 220

Gly Gly Thr Ala Thr Met Ser Tyr Lys Phe Pro Pro Val Pro Pro Glu
225                 230                 235                 240

Asn Leu Glu Gly Cys Ser Gln His Phe Tyr Glu Met Tyr Asn Pro Leu
                245                 250                 255

Tyr Gly Ser Arg Leu Gly Val Pro Asp Thr Leu Gly Gly Asp Pro Lys
            260                 265                 270

Phe Arg Ser Leu Thr His Glu Asp His Ala Ile Gln Pro Gln Asn Phe
        275                 280                 285

Met Pro Gly Pro Leu Val Asn Ser Val Ser Thr Lys Glu Gly Asp Ser
    290                 295                 300

Ser Ser Thr Gly Ala Gly Lys Ala Leu Thr Gly Leu Ser Thr Gly Thr
```

305 310 315 320

Ser Gln Asn Thr Arg Ile Ser Leu Arg Pro Gly Pro Val Ser Gln Pro
325 330 335

Tyr His His Trp Asp Thr Asp Lys Tyr Val Thr Gly Ile Asn Ala Ile
340 345 350

Ser His Gly Gln Thr Thr Tyr Gly Asn Ala Glu Asp Lys Glu Tyr Gln
355 360 365

Gln Gly Val Gly Arg Phe Pro Asn Glu Lys Glu Gln Leu Lys Gln Leu
370 375 380

Gln Gly Leu Asn Met His Thr Tyr Phe Pro Asn Lys Gly Thr Gln Gln
385 390 395 400

Tyr Thr Asp Gln Ile Glu Arg Pro Leu Met Val Gly Ser Val Trp Asn
405 410 415

Arg Arg Ala Leu His Tyr Glu Ser Gln Leu Trp Ser Lys Ile Pro Asn
420 425 430

Leu Asp Asp Ser Phe Lys Thr Gln Phe Ala Ala Leu Gly Gly Trp Gly
435 440 445

Leu His Gln Pro Pro Pro Gln Ile Phe Leu Lys Ile Leu Pro Gln Ser
450 455 460

Gly Pro Ile Gly Gly Ile Lys Ser Met Gly Ile Thr Thr Leu Val Gln
465 470 475 480

Tyr Ala Val Gly Ile Met Thr Val Thr Met Thr Phe Lys Leu Gly Pro
485 490 495

Arg Lys Ala Thr Gly Arg Trp Asn Pro Gln Pro Gly Val Tyr Pro Pro
500 505 510

His Ala Ala Gly His Leu Pro Tyr Val Leu Tyr Asp Pro Thr Ala Thr
515 520 525

Asp Ala Lys Gln His His Arg His Gly Tyr Glu Lys Pro Glu Glu Leu
530 535 540

Trp Thr Ala Lys Ser Arg Val His Pro Leu
545 550

<210> 36
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer VP-5

<400> 36
aggaagtttg ccggaagttc 20

<210> 37
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer VP-3

<400> 37
gtgctgaaac tctaaaggtg 20

<210> 38
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer VP2-5

<400> 38
gacatggata tgaaaagcct gaag 24

<210> 39
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer VP2-3

<400> 39
gttgttcata tctggttaag tact 24

<210> 40
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer K-1sp

<400> 40
ataaatccat atactcatt 19

<210> 41
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer K-2sp

<400> 41
ctaaagtatc ctgaccttg 19

<210> 42
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer Hicks-5

<400> 42
cccgccttat gcaaatgggc ag 22

<210> 43
<211> 22

<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer Hicks-3

<400> 43
ttgtgttagg ctgtcttata gg 22

<210> 44
<211> 54
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer NS1-5

<400> 44
atactctcta gacaaaacaa aatggagcta tttagagggg tgcttcaagt ttct 54

<210> 45
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer NS1-3

<400> 45
gagtatgtcg acttactcat aatctacaaa gctttgcaat ccagacag 48

<210> 46
<211> 55
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer VP1-5SN

<400> 46
atactcaagc ttacaaaaca aaatgagtaa agaaagtggc aaatggtggg aaagt 55

<210> 47
<211> 51
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer VPALL-3

<400> 47
gagtatgtcg acttacaatg ggtgcacacg gcttttggct gtccacaatt c 51

<210> 48
<211> 55
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer VP2-5SN

<400> 48
atactcaagc ttacaaaaca aaatgacttc agttaattct gcagaagcca gcact 55

<210> 49
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VSPC1

<400> 49
aaaaaaaaaa aaaaaaaaaa atccttaaca gcaatttctg ata 43

<210> 50
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VSPC2

<400> 50
aaaaaaaaaa aaaaaaaaaa cgccctgtag tgctgtcag 39

<210> 51
<211> 42
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VSPC3

<400> 51
aaaaaaaaaa aaaaaaaaaa tatacccaaa taggaagttc tg 42

<210> 52
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VSPC4

<400> 52
aaaaaaaaaa aaaaaaaaaa taaaatgctg attcttcact tgc 43

<210> 53
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VSPC5

<400> 53
aaaaaaaaaa aaaaaaaaaa tgctgtacct cctgtaccta 40

<210> 54
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VSPC6

<400> 54
aaaaaaaaaa aaaaaaaaaa agccctctaa attttctggg 40

<210> 55
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: VSPC7

<400> 55
aaaaaaaaaa aaaaaaaaaa ctcctaatgt gtcaggaacc 40

<210> 56
<211> 51
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer VSA1

<400> 56
aattctaata cgactcacta tagggagaag gccatatact cattggactg t 51

<210> 57
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer VSA2

<400> 57
aattctaata cgactcacta tagggagaag gccagagcac cattataa 48

<210> 58
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer VSA3

<400> 58
aattctaata cgactcacta tagggagaag gcacaatgcc agtggaaa 48

<210> 59
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer VSP2

<400> 59
gtgctgaaac tctaaaggt 19

<210> 60
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer VSP1

<400> 60
ggaggcaaag gtttgca 17

<210> 61
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> (1)
<223> where 'c' is modified 5' with fluorescein phosphoramidite

<220>
<221> misc_feature
<222> (20)
<223> where 't' is modified 3' with DABCYL

<220>
<223> Description of Artificial Sequence: primer VSPPR1

<400> 61
cccatggaga tatttagatt 20

<210> 62
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH80-1

<400> 62
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg ttaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaatttg 480
tttttttcac ctttagagtt tcagcattta attgaaaact atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggagtacaag ttactgacag cactaccggg cgcctatgca tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 63
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate CH81-3

<400> 63
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240

agtaatcctg ttaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tcgcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatacttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 64
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL1-4

<400> 64
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 65
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL2-1

<400> 65
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 66
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL3-1

<400> 66
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60

gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 67
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL4-3

<400> 67
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 68
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL5-2

<400> 68
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 69
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL6-2

<400> 69
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 70
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL7-3

<400> 70
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 71
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL8-2

<400> 71
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag gttttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 72
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL9-1

<400> 72
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcaat taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tcaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag ccagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 73
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL9-9

<400> 73
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 74
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL10-2

<400> 74
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 75
<211> 700

<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL11-1

<400> 75
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttat 700

<210> 76
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL12-1

<400> 76
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tcaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtgact 300
tgtacatttt ccagacagtt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtccgataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacagacaa aactggaggg 600
ggggtgcaag ttactgacag cagtacaggg cgcctatgca tgttagtaga ccatgaatac 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 77
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL13-3

<400> 77
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtgcatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 78
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL14-1

<400> 78
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 79
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL15-3

<400> 79
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 80
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL16-2

<400> 80
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600

ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttat 700

<210> 81
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL17-1

<400> 81
ataaatccat atacttattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 82
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL18-1

<400> 82
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 83
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL19-1

<400> 83
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420

agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 84
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL20-3

<400> 84
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 85
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL21-3

<400> 85
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
tttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 86
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL22-11

<400> 86
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcggg agggggggc 240

agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatttag attttaatgc tttaaattta 480
ttttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 87
<211> 700
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: isolate B19SCL2-14

<400> 87
ataaatccat atactcattg gactgtagca gatgaagagc ttttaaaaaa tataaaaaat 60
gaaactgggt ttcaagcaca agtagtaaaa gactacttta ctttaaaagg tgcagctgcc 120
cctgtggccc attttcaagg aagtttgccg gaagttcccg cttacaacgc ctcagaaaaa 180
tacccaagca tgacttcagt taattctgca gaagccagca ctggtgcagg agggggggc 240
agtaatcctg tgaaaagcat gtggagtgag ggggccactt ttagtgccaa ctctgtaact 300
tgtacatttt ccagacaatt tttaattcca tatgacccag agcaccatta taaggtgttt 360
tctcccgcag caagtagctg ccacaatgcc agtggaaagg aggcaaaggt ttgcaccatt 420
agtcccataa tgggatactc aaccccatgg agatatctag attttaatgc tttaaattta 480
ttttttttcac ctttagagtt tcagcactta attgaaaatt atggaagtat agctcctgat 540
gctttaactg taaccatatc agaaattgct gttaaggatg ttacggacaa aactggaggg 600
ggggtgcagg ttactgacag cactacaggg cgcctatgca tgttagtaga ccatgaatat 660
aagtacccat atgtgttagg gcaaggtcag gatactttag 700

<210> 88
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer Vpara 8

<400> 88
tccatatgac ccagagcacc a 21

<210> 89
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer Vpara 9

<400> 89
tttccactgg cattgtggc 19

<210> 90
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<221> misc_feature
<222> (1)
<223> where 'a' is modified 5' with Fam

<220>
<221> misc_feature
<222> (21)
<223> where 'g' is modified 3' with Tamra

<220>
<223> Description of Artificial Sequence: primer Vpara10

<400> 90
agctagacct gcatgtcact g 21

<210> 91
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: target sequence

<400> 91
ctacttgctg cgggagaaaa acacct 26

<210> 92
<211> 681
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: internal control sequence

<400> 92
gaattcactt gtacattttc cagacaattt ttaattccat atgacccaga gcaccattat 60
acagtgacat gcaggtctag ctctgccaca atgccagtgg aaaggaggca aaggtttgca 120
ccattagtcc cataatggga tactcaaccc catggagata tttagatttt aatgctttaa 180
atttattttt ttcaccttta gagtttcagc acttaattga aaattatgga agtatagctc 240
ctgatgcttt aactgtaacc atatcagaaa ttgctgttaa ggatgttacg gacaaaactg 300
gagggggggt gcaggttact gacagcacta cagggcgcct atgcatgtta gtagaccatg 360
aatataagta cccatatgtg ttagggcaag gtcaagatac tttagcccca gaacttccta 420
tttgggtata ctttcccccc caatacgctt acttaacagt aggagatgtt aacacacaag 480
gaatttctgg agacagcaaa aaattggcaa gtgaagaatc agcattttat gttttggaac 540
acagttcttt tcagctttta ggtacaggag gtacagcaac tatgtcttat aagtttcctc 600
cagtgccccc agaaaattta gagggctgca gtcaacactt ttatgaaatg tacaacccct 660
tatacggatc ccgctgtcga c 681