

SEQUENCE LISTING

<110> C4U Corporation
Osaka University

<120> METHOD FOR DETECTING SPECIFIC DNA IN SAMPLE

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<150> JP 2020-010216

<151> 2020-01-24

<150> JP 2020-086698

<151> 2020-05-18

<160> 47

<170> PatentIn version 3.5

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<211> 888

<212> PRT

<213> Escherichia coli

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Gln Asn Thr Phe Cys Arg Asn Glu Met Leu Ser Lys Gln Arg Val Lys
50 55 60

Ala Trp Leu Leu Phe Phe Ile Ala Leu His Asp Ile Gly Lys Phe Asp
65 70 75 80

Ile Arg Phe Gln Tyr Lys Ser Ala Glu Ser Trp Leu Lys Leu Asn Pro
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Ala Thr Pro Ser Leu Asn Gly Pro Ser Thr Gln Met Cys Arg Lys Phe
100 105 110

Asn His Gly Ala Ala Gly Leu Tyr Trp Phe Asn Gln Asp Ser Leu Ser
115 120 125

Glu Gln Ser Leu Gly Asp Phe Phe Ser Phe Phe Asp Ala Ala Pro His
 130 135 140

Pro Tyr Glu Ser Trp Phe Pro Trp Val Glu Ala Val Thr Gly His His
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Gly Phe Ile Leu His Ser Gln Asp Gln Asp Lys Ser Arg Trp Glu Met
 165 170 175

Pro Ala Ser Leu Ala Ser Tyr Ala Ala Gln Asp Lys Gln Ala Arg Glu
 180 185 190

Glu Trp Ile Ser Val Leu Glu Ala Leu Phe Leu Thr Pro Ala Gly Leu
 195 200 205

Ser Ile Asn Asp Ile Pro Pro Asp Cys Ser Ser Leu Leu Ala Gly Phe
 210 215 220

Cys Ser Leu Ala Asp Trp Leu Gly Ser Trp Thr Thr Thr Asn Thr Phe
 225 230 235 240

Leu Phe Asn Glu Asp Ala Pro Ser Asp Ile Asn Ala Leu Arg Thr Tyr
 245 250 255

Phe Gln Asp Arg Gln Gln Asp Ala Ser Arg Val Leu Glu Leu Ser Gly
 260 265 270

Leu Val Ser Asn Lys Arg Cys Tyr Glu Gly Val His Ala Leu Leu Asp
 275 280 285

Asn Gly Tyr Gln Pro Arg Gln Leu Gln Val Leu Val Asp Ala Leu Pro
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Val Ala Pro Gly Leu Thr Val Ile Glu Ala Pro Thr Gly Ser Gly Lys
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Thr Glu Thr Ala Leu Ala Tyr Ala Trp Lys Leu Ile Asp Gln Gln Ile
 325 330 335

Ala Asp Ser Val Ile Phe Ala Leu Pro Thr Gln Ala Thr Ala Asn Ala
 340 345 350

Met Leu Thr Arg Met Glu Ala Ser Ala Ser His Leu Phe Ser Ser Pro
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 370 375 380

Ser Ile Lys Ser Arg Ala Ile Thr Glu Gln Gly Gln Glu Glu Ala Trp
 385 390 395 400

Val Gln Cys Cys Gln Trp Leu Ser Gln Ser Asn Lys Lys Val Phe Leu
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Gly Gln Ile Gly Val Cys Thr Ile Asp Gln Val Leu Ile Ser Val Leu
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Pro Val Lys His Arg Phe Ile Arg Gly Leu Gly Ile Gly Arg Ser Val
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Leu Glu Ala Val Leu Lys Ala Gln Ala Asp Val Gly Gly Ser Val Ile
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Leu Leu Ser Ala Thr Leu Pro Met Lys Gln Lys Gln Lys Leu Leu Asp
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Thr Gln Val Asp Ile Asp Leu Phe His Ala Arg Phe Thr Leu Asn Asp
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Arg Arg Glu Lys Glu Asn Arg Val Ile Ser Asn Phe Gly Lys Asn Gly
 610 615 620

Lys Arg Asn Val Gly Arg Ile Leu Val Ala Thr Gln Val Val Glu Gln
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Ser Leu Asp Val Asp Phe Asp Trp Leu Ile Thr Gln His Cys Pro Ala
 645 650 655

Asp Leu Leu Phe Gln Arg Leu Gly Arg Leu His Arg His His Arg Lys
 660 665 670

Tyr Arg Pro Ala Gly Phe Glu Ile Pro Val Ala Thr Ile Leu Leu Pro
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Asp Gly Glu Gly Tyr Gly Arg His Glu His Ile Tyr Ser Asn Val Arg
 690 695 700

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Leu Phe Phe Pro Asp Ala Tyr Arg Gln Trp Leu Asp Ser Ile Tyr Asp
 725 730 735

Asp Ala Glu Met Asp Glu Pro Glu Trp Val Gly Asn Gly Met Asp Lys
 740 745 750

Phe Glu Ser Ala Glu Cys Glu Lys Arg Phe Lys Ala Arg Lys Val Leu
 755 760 765

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Gln Thr Ser Ser Gly Lys Gln Leu Leu Asp Gly Gln Val Tyr Glu Asp
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Leu Ser His Glu Gln Gln Tyr Glu Ala Leu Ala Leu Asn Arg Val Asn
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 <213> Escherichia coli

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Gln Trp Arg Leu Ser Leu Pro Arg Asp Asp Met Glu Leu Ala Ala Leu
 35 40 45

Ala Leu Leu Val Cys Ile Gly Gln Ile Ile Ala Pro Ala Lys Asp Asp
 50 55 60

Val Glu Phe Arg His Arg Ile Met Asn Pro Leu Thr Glu Asp Glu Phe
 65 70 75 80

Gln Gln Leu Ile Ala Pro Trp Ile Asp Met Phe Tyr Leu Asn His Ala
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Glu His Pro Phe Met Gln Thr Lys Gly Val Lys Ala Asn Asp Val Thr
 100 105 110

Pro Met Glu Lys Leu Leu Ala Gly Val Ser Gly Ala Thr Asn Cys Ala
 115 120 125

Phe Val Asn Gln Pro Gly Gln Gly Glu Ala Leu Cys Gly Gly Cys Thr

130

135

140

Ala Ile Ala Leu Phe Asn Gln Ala Asn Gln Ala Pro Gly Phe Gly Gly
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Gly Phe Lys Ser Gly Leu Arg Gly Gly Thr Pro Val Thr Thr Phe Val
 165 170 175

Arg Gly Ile Asp Leu Arg Ser Thr Val Leu Leu Asn Val Leu Thr Leu
 180 185 190

Pro Arg Leu Gln Lys Gln Phe Pro Asn Glu Ser His Thr Glu Asn Gln
 195 200 205

Pro Thr Trp Ile Lys Pro Ile Lys Ser Asn Glu Ser Ile Pro Ala Ser
 210 215 220

Ser Ile Gly Phe Val Arg Gly Leu Phe Trp Gln Pro Ala His Ile Glu
 225 230 235 240

Leu Cys Asp Pro Ile Gly Ile Gly Lys Cys Ser Cys Cys Gly Gln Glu
 245 250 255

Ser Asn Leu Arg Tyr Thr Gly Phe Leu Lys Glu Lys Phe Thr Phe Thr
 260 265 270

Val Asn Gly Leu Trp Pro His Pro His Ser Pro Cys Leu Val Thr Val
 275 280 285

Lys Lys Gly Glu Val Glu Glu Lys Phe Leu Ala Phe Thr Thr Ser Ala
 290 295 300

Pro Ser Trp Thr Gln Ile Ser Arg Val Val Val Asp Lys Ile Ile Gln
 305 310 315 320

Asn Glu Asn Gly Asn Arg Val Ala Ala Val Val Asn Gln Phe Arg Asn
 325 330 335

Ile Ala Pro Gln Ser Pro Leu Glu Leu Ile Met Gly Gly Tyr Arg Asn
 340 345 350

Asn Gln Ala Ser Ile Leu Glu Arg Arg His Asp Val Leu Met Phe Asn
 355 360 365

Gln Gly Trp Gln Gln Tyr Gly Asn Val Ile Asn Glu Ile Val Thr Val
 370 375 380

Gly Leu Gly Tyr Lys Thr Ala Leu Arg Lys Ala Leu Tyr Thr Phe Ala
 385 390 395 400

Glu Gly Phe Lys Asn Lys Asp Phe Lys Gly Ala Gly Val Ser Val His
 405 410 415

Glu Thr Ala Glu Arg His Phe Tyr Arg Gln Ser Glu Leu Leu Ile Pro
 420 425 430

Asp Val Leu Ala Asn Val Asn Phe Ser Gln Ala Asp Glu Val Ile Ala
 435 440 445

Asp Leu Arg Asp Lys Leu His Gln Leu Cys Glu Met Leu Phe Asn Gln
 450 455 460

Ser Val Ala Pro Tyr Ala His His Pro Lys Leu Ile Ser Thr Leu Ala
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Gly Gly Pro Ser Asn Gly
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 <213> Escherichia coli

<400> 3

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 35 40 45

Trp Glu Asn Pro Arg His Gln Gln Ala Leu Leu Arg Met Val Phe Cys
 50 55 60

Leu Ser Ala Gly Lys Asn Val Ile Arg His Gln Asp Lys Lys Ser Glu
65 70 75 80

Gln Thr Thr Gly Ile Ser Leu Gly Arg Ala Leu Ala Asn Ser Gly Arg
85 90 95

Ile Asn Glu Arg Arg Ile Phe Gln Leu Ile Arg Ala Asp Arg Thr Ala
100 105 110

Asp Met Val Gln Leu Arg Arg Leu Leu Thr His Ala Glu Pro Val Leu
115 120 125

Asp Trp Pro Leu Met Ala Arg Met Leu Thr Trp Trp Gly Lys Arg Glu
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<213> Escherichia coli

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Arg Ser Gly Leu Leu Gly Leu Leu Gly Ala Cys Leu Gly Ile Gln Arg
35 40 45

Asp Asp Thr Ser Ser Leu Gln Ala Leu Ser Glu Ser Val Gln Phe Ala
50 55 60

Val Arg Cys Asp Glu Leu Ile Leu Asp Asp Arg Arg Val Ser Val Thr
65 70 75 80

Gly Leu Arg Asp Tyr His Thr Val Leu Gly Ala Arg Glu Asp Tyr Arg
85 90 95

Gly Leu Lys Ser His Glu Thr Ile Gln Thr Trp Arg Glu Tyr Leu Cys

100

105

110

Asp Ala Ser Phe Thr Val Ala Leu Trp Leu Thr Pro His Ala Thr Met
 115 120 125

Val Ile Ser Glu Leu Glu Lys Ala Val Leu Lys Pro Arg Tyr Thr Pro
 130 135 140

Tyr Leu Gly Arg Arg Ser Cys Pro Leu Thr His Pro Leu Phe Leu Gly
 145 150 155 160

Thr Cys Gln Ala Ser Asp Pro Gln Lys Ala Leu Leu Asn Tyr Glu Pro
 165 170 175

Val Gly Gly Asp Ile Tyr Ser Glu Glu Ser Val Thr Gly His His Leu
 180 185 190

Lys Phe Thr Ala Arg Asp Glu Pro Met Ile Thr Leu Pro Arg Gln Phe
 195 200 205

Ala Ser Arg Glu Trp Tyr Val Ile Lys Gly Gly Met Asp Val Ser Gln
 210 215 220

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 <213> Escherichia coli

<400> 5

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Ala Ala Arg Asp Phe Leu Phe His Val Glu Lys Arg Asn Thr Pro Glu
 35 40 45

Gly Cys His Val Leu Leu Gln Ser Ala Gln Met Pro Val Ser Thr Ala
 50 55 60

Val Ala Thr Val Ile Lys Thr Lys Gln Val Glu Phe Gln Leu Gln Val
 65 70 75 80

Gly Val Pro Leu Tyr Phe Arg Leu Arg Ala Asn Pro Ile Lys Thr Ile
85 90 95

Leu Asp Asn Gln Lys Arg Leu Asp Ser Lys Gly Asn Ile Lys Arg Cys
100 105 110

Arg Val Pro Leu Ile Lys Glu Ala Glu Gln Ile Ala Trp Leu Gln Arg
115 120 125

Lys Leu Gly Asn Ala Ala Arg Val Glu Asp Val His Pro Ile Ser Glu
130 135 140

Arg Pro Gln Tyr Phe Ser Gly Asp Gly Lys Ser Gly Lys Ile Gln Thr
145 150 155 160

Val Cys Phe Glu Gly Val Leu Thr Ile Asn Asp Ala Pro Ala Leu Ile
165 170 175

Asp Leu Val Gln Gln Gly Ile Gly Pro Ala Lys Ser Met Gly Cys Gly
180 185 190

Leu Leu Ser Leu Ala Pro Leu
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Gly Lys Arg Arg Val Arg Ile Ser Ser Gln Ser Leu Lys Arg Ala Met
35 40 45

Arg Lys Ser Gly Tyr Tyr Ala Gln Asn Ile Gly Glu Ser Ser Leu Arg
50 55 60

Thr Ile His Leu Ala Gln Leu Arg Asp Val Leu Arg Gln Lys Leu Gly
65 70 75 80

Glu Arg Phe Asp Gln Lys Ile Ile Asp Lys Thr Leu Ala Leu Leu Ser
85 90 95

Gly Lys Ser Val Asp Glu Ala Glu Lys Ile Ser Ala Asp Ala Val Thr
100 105 110

Pro Trp Val Val Gly Glu Ile Ala Trp Phe Cys Glu Gln Val Ala Lys
115 120 125

Ala Glu Ala Asp Asn Leu Asp Asp Lys Lys Leu Leu Lys Val Leu Lys
130 135 140

Glu Asp Ile Ala Ala Ile Arg Val Asn Leu Gln Gln Gly Val Asp Ile
145 150 155 160

Ala Leu Ser Gly Arg Met Ala Thr Ser Gly Met Met Thr Glu Leu Gly
165 170 175

Lys Val Asp Gly Ala Met Ser Ile Ala His Ala Ile Thr Thr His Gln
180 185 190

Val Asp Ser Asp Ile Asp Trp Phe Thr Ala Val Asp Asp Leu Gln Glu
195 200 205

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

Tyr Arg Tyr Ala Asn Ile Asn Leu Ala Gln Leu Gln Glu Asn Leu Gly
225 230 235 240

Gly Ala Ser Arg Glu Gln Ala Leu Glu Ile Ala Thr His Val Val His
245 250 255

Met Leu Ala Thr Glu Val Pro Gly Ala Lys Gln Arg Thr Tyr Ala Ala
260 265 270

Phe Asn Pro Ala Asp Met Val Met Val Asn Phe Ser Asp Met Pro Leu
275 280 285

Ser Met Ala Asn Ala Phe Glu Lys Ala Val Lys Ala Lys Asp Gly Phe
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 <212> DNA
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 <212> DNA

<213> Escherichia coli

<400> 9

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cttactcacg ccgaaccgtg acttgactgg ccattaatgg ccaggatgtt gacctggtgg      420
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<211> 675

<212> DNA

<213> Escherichia coli

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<211> 600

<212> DNA

<213> Escherichia coli

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 aagcgccctgg acagtaaagg gaatatataa cgctgtcggg ttccgttaat aaaagaagca 360
 gaacaaatcg cgtgggttga acgtaaaattg ggcaatgcgg cgcgcgttga agatgtgcat 420
 cccatatcgg aacggccaca gtatittttct ggtgatggta aaagtggaaa gatccaaacg 480
 gtttgctttg aagggtgtgct caccatcaac gacgcgccag cgtaataga tcttgtacag 540
 caagggtattg ggccagctaa atcgatggga tgtggcttgc tatctttggc tccactgtga 600

<210> 12
 <211> 1092
 <212> DNA
 <213> Escherichia coli

<400> 12
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 gacgatatga acatgcagaa agacgctatt ttcggcggca aaagacgagt aagaatttca 120
 agtcaaagcc ttaaacgtgc gatgcgtaaa agtgggttatt acgcacaaaa tattggtgaa 180
 tccagttctca gaaccattca tcttgcacaa ttacgtgatg ttcttcggca aaaacttgggt 240
 gaacgttttg accaaaaaat catcgataag acattagcgc tgctctccgg taaatcagtt 300
 gatgaagccg aaaagatttc tgccgatgcg gtactccct gggttgtggg agaaatagcc 360
 tggttctgtg agcaggttgc aaaagcagag gctgataatc tggatgataa aaagctgctc 420
 aaagtcttta aggaagatat tgccgccata cgtgtgaatt tacagcaggg tgttgatatt 480
 gcgcttagtg gaagaatggc aaccagcggc atgatgactg agttgggaaa agttgatggt 540
 gcaatgtcca ttgcgcatgc gatcactact catcaggttg attctgatat tgactggttc 600
 accgctgtag atgatttaca ggaacaaggt tctgcacatc tgggaactca ggaattttca 660
 tcgggtgttt ttatcgtta tgccaacatt aacctcgctc aacttcagga aaatttaggt 720
 ggtgcctcca gggagcaggc tctggaaatt gcaacccatg ttgttcatat gctggcaaca 780
 gaggtccctg gagcaaaaca gcgtacttat gccgcttita accctgcgga tatggtaatg 840
 gttaatcttct ccgatatgcc actttctatg gcaaattgctt ttgaaaaagc ggttaaagcg 900

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aaagatggct ttttgcaacc gtctatacag gcgtttaatc aatattggga tcgcgttgcc      960
aatggataatg gtctgaacgg agctgctgcg caattcagct tatctgatgt agaccacaatt    1020
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ggcgaggcgt ga                                                              1092

```

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<210> 13
<211> 7
<212> PRT
<213> Artificial Sequence

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```

<220>
<223> NLS

```

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<400> 13

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```

Pro Lys Lys Lys Arg Lys Val
1                               5

```

```

<210> 14
<211> 19
<212> PRT
<213> Artificial Sequence

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```

<220>
<223> bpNLS

```

```

<400> 14

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```

Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys Arg
1                               5               10               15

```

```

Lys Val Glu

```

```

<210> 15
<211> 60
<212> DNA
<213> Artificial Sequence

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<220>
<223> Target DNA (hEMX1)

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<220>
<221> protein_bind
<222> (16)..(18)
<223> various PAM sequence

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<220>
<221> misc_feature
<222> (16)..(18)

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<223> n is a, c, g, or t

<400> 15
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<210> 16
<211> 60
<212> DNA
<213> Artificial Sequence

<220>
<223> Target DNA (mTyr)

<220>
<221> protein_bind
<222> (16).. (18)
<223> various PAM sequence

<220>
<221> misc_feature
<222> (16).. (18)
<223> n is a, c, g, or t

<400> 16
gcattactat gtgtcnnngg acacactgct tgggggctct gaaatatgga gggacattga 60

<210> 17
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Taqman probe sequence

<400> 17
gtcaacggat ttggtc 16

<210> 18
<211> 35
<212> DNA
<213> Coronavirus

<400> 18
aaggccaaac tgtcactaag aaatctgctg ctgag 35

<210> 19
<211> 35
<212> DNA
<213> Coronavirus

<400> 19
aaggaactga ttacaaacat tggccgcaaa ttgca 35

<210> 20
 <211> 41
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer "SARS-N1-FIP"

<400> 20
 gttggccttt accagacatt ttggtgatgc tgctcttgct t 41

<210> 21
 <211> 42
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer "SARS-N1-BIP"

<400> 21
 tgctgaggct tctaagaagc cagcttgtgt tacattgtat gc 42

<210> 22
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer "SARS-N1-F3"

<400> 22
 acttctcctg ctagaatgg 19

<210> 23
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer "SARS-N1-B3"

<400> 23
 gtttgttctg gaccacgt 18

<210> 24
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer "SARS-N1-LF"

<400> 24

ttcaatctgt caagcagcag ca 22

<210> 25
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer "SARS-N1-LB"

<400> 25
 ggcaaaaacg tactgccact a 21

<210> 26
 <211> 44
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer "SARS-N2-FIP"

<400> 26
 tctgattagt tcctggtccc caaagcatac aatgtaacac aagc 44

<210> 27
 <211> 39
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer "SARS-N2-BIP"

<400> 27
 cgcattggca tggaagtcac tttgatggca cctgtgtag 39

<210> 28
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer "SARS-N2-F3"

<400> 28
 gcaaaaacgt actgccac 18

<210> 29
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer "SARS-N2-B3"

<400> 29
gaaatttggg tctttgtcat cc 22

<210> 30
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> primer "SARS-N2-LF"

<400> 30
tggaccacgt ctgccga 17

<210> 31
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> primer "SARS-N2-LB"

<400> 31
accttcggga acgtggtt 18

<210> 32
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> probe sequence for lateral flow assay

<400> 32
gtcaacggat ttggtc 16

<210> 33
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> crRNA "H1N1-Cascade-138"

<400> 33
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<210> 34
<211> 32
<212> DNA
<213> Artificial Sequence

<220>		
<223>	crRNA "H3N2-Cascade-138"	
<400>	34	
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<210>	35	
<211>	32	
<212>	DNA	
<213>	Artificial Sequence	
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<223>	crRNA "H1N1-Cascade-1222"	
<400>	35	
	attgagaaca caagagtctg aatgtgcatg tg	32
<210>	36	
<211>	32	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	crRNA "H1N1-Cascade-H274"	
<400>	36	
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<210>	37	
<211>	32	
<212>	DNA	
<213>	Artificial Sequence	
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<223>	crRNA "H3N2-Cascade-N294"	
<400>	37	
	ctgtctctgc agacacatct gacaccagga ta	32
<210>	38	
<211>	80	
<212>	DNA	
<213>	Influenza A virus	
<400>	38	
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	gtttcatgta ttcggatttc	80
<210>	39	
<211>	80	
<212>	DNA	
<213>	Influenza A virus	

<400> 39
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 gtttcatgta ttcggatttc 80

<210> 40
 <211> 80
 <212> DNA
 <213> Influenza A virus

<400> 40
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 tgtttcatgt attcagattt 80

<210> 41
 <211> 80
 <212> DNA
 <213> Influenza A virus

<400> 41
 ggggaggatc tgaaaattga aaccaacaaa ttgcagcaa catgcactca ctggaggtg 60
 tgtttcatgt attcagattt 80

<210> 42
 <211> 80
 <212> DNA
 <213> Influenza A virus

<400> 42
 ggcataataa cagacactat caagagttgg aggaacaata tattgagaac acaagagtct 60
 gaatgtgcat gtgtaaattg 80

<210> 43
 <211> 80
 <212> DNA
 <213> Influenza A virus

<400> 43
 ggcataataa cagacactat caagagttgg aggaacaata gattgagaac acaagagtct 60
 gaatgtgcat gtgtaaattg 80

<210> 44
 <211> 80
 <212> DNA
 <213> Influenza A virus

<400> 44
 aaagataatc aaatcagtcg aaatgaaagc ccctaattat cactatgagg aatgctcctg 60

ttaccctgat tctagtgaag 80

<210> 45
 <211> 80
 <212> DNA
 <213> Influenza A virus

<400> 45
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 ttaccctgat tctagtgaag 80

<210> 46
 <211> 80
 <212> DNA
 <213> Influenza A virus

<400> 46
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 cccatcatag atataaacat 80

<210> 47
 <211> 80
 <212> DNA
 <213> Influenza A virus

<400> 47
 tatcctcgat atcctgggtgt cagatgtgtc tgcagagaca gctggaaaagg atccaaccgg 60
 cccatcatag atataaacat 80