

SEQUENCE LISTING

<110> INSTITUT PASTEUR
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE

<120> A DENGUE VIRUS CHIMERIC POLYPEPTIDE COMPOSED OF FRAGMENTS OF
NON-STRUCTURAL PROTEINS AND ITS USE IN AN IMMUNOGENIC COMPOSITION
AGAINST DENGUE VIRUS INFECTION

<130> B10753A AD/DP/AM

<140> PCT/EPXXXXXX
<141> 2015-06-22

<150> EP14305984.8
<151> 2014-06-23

<160> 152

<170> PatentIn version 3.5

<210> 1
<211> 1617
<212> DNA
<213> Artificial Sequence

<220>
<223> Native nucleotide sequence of the polynucleotide encoding the
chimeric polypeptide of DENV1

<400> 1
gcatcacaag aagggcccct accagagatt gaagatgagg tgtttaggaa aagaaactta 60
acaataatgg acctacatcc aggatcaggg aaaacaagaa gatattctcc agccatagtc 120
cgtgaggcca taaaaaggaa gctgcgcaca ctaattttgg ctcccacaag gggtgtcgtc 180
tccgaaatgg cagaggcgct caagggaatg ccaataaggt accaaacaac agcagtgaag 240
agtgaacaca caggaaaaga gatagttgac ctcatgtgcc acgccacttt caccatgcgt 300
ctcctgtctc ccgtgagagt tcccaattac aacatgatta ttatggatga agcacatttc 360
accgatccat ccagtatagc agccagaggg tacattctca cccgagtggg catgggtgaa 420
gcagctgcga tcttcatgac agccactcct ccaggatcag tggaggcctt tccacagagc 480
aatgcagtta tccaagatga ggaaagagac attcctgaga gatcatggaa ctgaggatat 540
gagtggtatc ctgacagga ccatgctcat tggacagaag caaaaatgct ccttgacaac 600
ataaacacac cagaaggaat tatcccagct ctctttgagc cggagagaga aaagagtgca 660
gcaatagacg gggagtacag actgcgggga gaagcaagga aaacgttcgt ggagctcatg 720

agaagaggag atttaccagt ttggctatct tacaaagttg cctcagaagg cttccaatac	780
tccgatagaa ggtggtgctt tgatggagaa aggaacaacc aggtgttgga ggaaaacatg	840
gacgtggaga tctggacaaa ggagggagaa agaaagaaat tacgaccccg ctggttggac	900
gccagaacat actctgatcc actggccctg cgcgagttca aagagttcgc agcaggagtg	960
gctgttgaat atcaccacca tgccgcaatg ctggacgtag acttacatcc agcttcagcc	1020
tggaccctct atgcagtggc cacaacaatt atcactccca tgatgaggca cacaatagaa	1080
aacacaacgg caaacatttc cctgacagcc attgcaaacc aggcggctat attgatggga	1140
cttgacaaaag gatggccaat atcgaagatg gacataggag ttccacttct cgccttgggg	1200
tgctattccc aggtgctgga tatcattggc cagaggatag agaacataaa acatgaacat	1260
aagtcaacat ggcatatga tgaggacaat ccatataaaa catgggccta tcacggatca	1320
tatgaggta agccatcagg atcagcctca tccatggtca atggcgtggt gaaactgctc	1380
accaaaccat gggatgtcat ccccatggtc acacaaatag ccatgactga caccacaccc	1440
tttggacaac agagggtgtt caaagagaaa gttgacacgc gcacacaaa agcaaaacga	1500
ggcacagcac aaatcatgga ggtgacagcc aaatggttat ggggttttct ttctagaaac	1560
aaaaaaccaa gaatttgtac aagagaggag ttcacaagaa aagtcaggtc aaacgca	1617

<210> 2

<211> 1617

<212> DNA

<213> Artificial Sequence

<220>

<223> Optimised nucleotide sequence of the polynucleotide encoding the chimeric polyepitope of DENV1 (human codon optimised, measles optimised)

<400> 2

gcatcacagg agggaccact gcccgaatt gaggacgaag tgtttagaaa gcgaaatctg	60
actattatgg acctgcaccc cggatctggc aagaccgga gatactgcc agccatcgtg	120
agggaggcta ttaagcggaa actgagaaca ctgacatgg cccaactcg cgtggtcgtc	180
tccgaaatgg ctgaggccct gaaaggcatg cccatccgt atcagaccac agcagtgaag	240
tctgaacata ccggcaagga gattgtggac ctgatgtgcc acgccacttt caccatgcga	300
ctgctgagcc cagtgcgggt cccaactac aatatgatca ttatggacga ggcccacttt	360

actgatccca gctccatcgc cgctagagga tatattttcca ccagggtggg aatgggcgag	420
gcagcagcta tcttcatgac agcaactccc cctggcagcg tggaggcatt tcctcagtcc	480
aacgccgtca tccaggacga ggagcgggac attcctgagc ggagctggaa ttctgggtac	540
gaatggatca cagacgagga tcatgcacac tggactgaag ccaagatgct gctggacaac	600
attaatactc ctgagggaaat cattccagct ctgttcgagc ccgaaagaga gaagtctgca	660
gccatcgacg gcgagtatag actgagggga gaggcccga agaccttcgt ggaactgatg	720
aggcgcggcg atctgcccgt gtggctgagt tacaaggtcg cttcagaggg attccagtat	780
agtgaccgac ggtggtgctt tgatggcgaa cgcaacaatc aggtgctgga ggagaacatg	840
gatgtcgaga tttggacaaa ggaaggcgag cggaagaaac tgcgcccacg atggctggac	900
gctcggactt acagcgatcc cctggcactg agagaattca aagagtttgc tgcaggggtg	960
gccgtcgaga atcaccatca cgccgctatg ctggacgtgg atctgcatcc tgccagtgct	1020
tggaccctgt atgcagtggc cactaccatc attaccccaa tgatgcgcca cacaatcgag	1080
aacacaactg ccaatatctc actgacagct attgcaaacc aggcagccat tctgatggga	1140
ctggacaaaag gctggcccat cagcaagatg gatattggcg tgcctctgct ggccctgggg	1200
tgttacagtc aggtgctgga catcattggc cagaggatcg agaacattaa gcatgagcac	1260
aaatcaacct ggcattacga cgaagataat ccctataaga catgggccta ccacggaagc	1320
tatgaggtga aaccttcagg cagcgccagc agcatggtca acggggtggt caagctgctg	1380
accaaacctt gggacgtgat cccaatggtc actcagattg ccatgaccga taccaccca	1440
ttcggccagc agcgggtggt caaggagaag gtggacaccc gcacaccta ggctaaacga	1500
gggactgcac agatcatgga ggtgaccgcc aagtggctgt ggggattcct gtccaggaac	1560
aagaagccaa gaatctgtac cagggaagag ttcacaagaa aggtccggtc aaacgcc	1617

<210> 3

<211> 539

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the chimeric polyepitope of DENV1

<400> 3

Ala Ser Gln Glu Gly Pro Leu Pro Glu Ile Glu Asp Glu Val Phe Arg
1 5 10 15

Lys Arg Asn Leu Thr Ile Met Asp Leu His Pro Gly Ser Gly Lys Thr
20 25 30

Arg Arg Tyr Leu Pro Ala Ile Val Arg Glu Ala Ile Lys Arg Lys Leu
35 40 45

Arg Thr Leu Ile Leu Ala Pro Thr Arg Val Val Ala Ser Glu Met Ala
50 55 60

Glu Ala Leu Lys Gly Met Pro Ile Arg Tyr Gln Thr Thr Ala Val Lys
65 70 75 80

Ser Glu His Thr Gly Lys Glu Ile Val Asp Leu Met Cys His Ala Thr
85 90 95

Phe Thr Met Arg Leu Leu Ser Pro Val Arg Val Pro Asn Tyr Asn Met
100 105 110

Ile Ile Met Asp Glu Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala
115 120 125

Arg Gly Tyr Ile Ser Thr Arg Val Gly Met Gly Glu Ala Ala Ala Ile
130 135 140

Phe Met Thr Ala Thr Pro Pro Gly Ser Val Glu Ala Phe Pro Gln Ser
145 150 155 160

Asn Ala Val Ile Gln Asp Glu Glu Arg Asp Ile Pro Glu Arg Ser Trp
165 170 175

Asn Ser Gly Tyr Glu Trp Ile Thr Asp Glu Asp His Ala His Trp Thr
180 185 190

Glu Ala Lys Met Leu Leu Asp Asn Ile Asn Thr Pro Glu Gly Ile Ile
195 200 205

Pro Ala Leu Phe Glu Pro Glu Arg Glu Lys Ser Ala Ala Ile Asp Gly
210 215 220

Glu Tyr Arg Leu Arg Gly Glu Ala Arg Lys Thr Phe Val Glu Leu Met
225 230 235 240

Arg Arg Gly Asp Leu Pro Val Trp Leu Ser Tyr Lys Val Ala Ser Glu
245 250 255

Gly Phe Gln Tyr Ser Asp Arg Arg Trp Cys Phe Asp Gly Glu Arg Asn
260 265 270

Asn Gln Val Leu Glu Glu Asn Met Asp Val Glu Ile Trp Thr Lys Glu
275 280 285

Gly Glu Arg Lys Lys Leu Arg Pro Arg Trp Leu Asp Ala Arg Thr Tyr
290 295 300

Ser Asp Pro Leu Ala Leu Arg Glu Phe Lys Glu Phe Ala Ala Gly Val
305 310 315 320

Ala Val Glu Asn His His His Ala Ala Met Leu Asp Val Asp Leu His
325 330 335

Pro Ala Ser Ala Trp Thr Leu Tyr Ala Val Ala Thr Thr Ile Ile Thr
340 345 350

Pro Met Met Arg His Thr Ile Glu Asn Thr Thr Ala Asn Ile Ser Leu
355 360 365

Thr Ala Ile Ala Asn Gln Ala Ala Ile Leu Met Gly Leu Asp Lys Gly
370 375 380

Trp Pro Ile Ser Lys Met Asp Ile Gly Val Pro Leu Leu Ala Leu Gly
385 390 395 400

Cys Tyr Ser Gln Val Leu Asp Ile Ile Gly Gln Arg Ile Glu Asn Ile
405 410 415

Lys His Glu His Lys Ser Thr Trp His Tyr Asp Glu Asp Asn Pro Tyr
420 425 430

Lys Thr Trp Ala Tyr His Gly Ser Tyr Glu Val Lys Pro Ser Gly Ser
435 440 445

Ala Ser Ser Met Val Asn Gly Val Val Lys Leu Leu Thr Lys Pro Trp
450 455 460

Asp Val Ile Pro Met Val Thr Gln Ile Ala Met Thr Asp Thr Thr Pro
465 470 475 480

Phe Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg Thr Pro
485 490 495

Lys Ala Lys Arg Gly Thr Ala Gln Ile Met Glu Val Thr Ala Lys Trp
500 505 510

Leu Trp Gly Phe Leu Ser Arg Asn Lys Lys Pro Arg Ile Cys Thr Arg
515 520 525

Glu Glu Phe Thr Arg Lys Val Arg Ser Asn Ala
530 535

<210> 4

<211> 555

<212> DNA

<213> Artificial Sequence

<220>

<223> Native nucleotide sequence of the polynucleotide encoding the first region of NS3 of DENV1

<400> 4

gcatcacaag aagggcccct accagagatt gaagatgagg tgtttaggaa aagaaactta	60
acaataatgg acctacatcc aggatcaggg aaaacaagaa gatattctccc agccatagtc	120
cgtgaggcca taaaaaggaa gctgcgcaca ctaattttgg ctcccacaag ggttgctcgt	180
tccgaaatgg cagaggcgct caagggaatg ccaataaggt accaaacaac agcagtgaag	240
agtgaacaca caggaaaaga gatagttgac ctcatgtgcc acgccacttt caccatgcgt	300
ctcctgtctc ccgtgagagt tcccaattac aacatgatta ttatggatga agcacatttc	360
accgatccat ccagtatagc agccagaggg tacatctcaa cccgagtggg catgggtgaa	420
gcagctgcga tcttcatgac agccactcct ccagatcag tggaggcctt tccacagagc	480

aatgcagtta tccaagatga ggaaagagac attcctgaga gatcatggaa ctcaggatat 540
gagtggatca ctgac 555

<210> 5
<211> 555
<212> DNA
<213> Artificial Sequence

<220>
<223> Optimised nucleotide sequence of the polynucleotide encoding the first region of NS3 of DENV1

<400> 5
gcatcacagg agggaccact gcccgaatt gaggacgaag tgtttagaaa gcgaaatctg 60
actattatgg acctgcaccc cggatctggc aagacccgga gatactgcc agccatcgtg 120
aggagggtta ttaagcggaa actgagaaca ctgacctgg cccaactcg cgtggtcgct 180
tccgaaatgg ctgaggccct gaaaggcatg cccatccggt atcagaccac agcagtgaag 240
tctgaacata ccggcaagga gattgtggac ctgatgtgcc acgccacttt caccatgcga 300
ctgctgagcc cagtgcgggt cccaactac aatatgatca ttatggacga ggcccacttt 360
actgatcca gctccatcg ctagagga tatatttcca ccagggtggg aatgggcgag 420
gcagcagcta tttcatgac agcaactccc cctggcagcg tggaggcatt tcctcagtcc 480
aacgccgtca tccaggacga ggagcgggac attcctgagc ggagctggaa ttctgggtac 540
gaatggatca cagac 555

<210> 6
<211> 185
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the first region of NS3 of DENV1

<400> 6

Ala Ser Gln Glu Gly Pro Leu Pro Glu Ile Glu Asp Glu Val Phe Arg
1 5 10 15

Lys Arg Asn Leu Thr Ile Met Asp Leu His Pro Gly Ser Gly Lys Thr
20 25 30

Arg Arg Tyr Leu Pro Ala Ile Val Arg Glu Ala Ile Lys Arg Lys Leu
35 40 45

Arg Thr Leu Ile Leu Ala Pro Thr Arg Val Val Ala Ser Glu Met Ala
50 55 60

Glu Ala Leu Lys Gly Met Pro Ile Arg Tyr Gln Thr Thr Ala Val Lys
65 70 75 80

Ser Glu His Thr Gly Lys Glu Ile Val Asp Leu Met Cys His Ala Thr
85 90 95

Phe Thr Met Arg Leu Leu Ser Pro Val Arg Val Pro Asn Tyr Asn Met
100 105 110

Ile Ile Met Asp Glu Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala
115 120 125

Arg Gly Tyr Ile Ser Thr Arg Val Gly Met Gly Glu Ala Ala Ala Ile
130 135 140

Phe Met Thr Ala Thr Pro Pro Gly Ser Val Glu Ala Phe Pro Gln Ser
145 150 155 160

Asn Ala Val Ile Gln Asp Glu Glu Arg Asp Ile Pro Glu Arg Ser Trp
165 170 175

Asn Ser Gly Tyr Glu Trp Ile Thr Asp
180 185

<210> 7

<211> 402

<212> DNA

<213> Artificial Sequence

<220>

<223> Native nucleotide sequence of the polynucleotide encoding the
second region of NS3 of DENV1

<400> 7

gaggaccatg ctcatggac agaagcaaaa atgctccttg acaacataaa cacaccagaa 60

ggaattatcc cagctctctt tgagccggag agagaaaaga gtgcagcaat agacggggag 120

tacagactgc	ggggagaagc	aaggaaaacg	ttcgtggagc	tcatgagaag	aggagattta	180
ccagtttggc	tatcttacia	agttgcctca	gaaggcttcc	aatactccga	tagaaggtgg	240
tgctttgatg	gagaaaggaa	caaccaggtg	ttggaggaaa	acatggacgt	ggagatctgg	300
acaaaggagg	gagaaagaaa	gaaattacga	ccccgctggt	tggacgccag	aacatactct	360
gatccactgg	ccctgcgcga	gttcaaagag	ttcgcagcag	ga		402

<210>	8
<211>	402
<212>	DNA
<213>	Artificial Sequence

<400>	8						
gaggatcatg	cacactggac	tgaagccaag	atgttgctgg	acaacattaa	tactcctgag		60
ggaatcattc	cagctctgtt	cgagcccgaa	agagagaagt	ctgcagccat	cgacggcgag		120
tatagactga	ggggagaggc	ccggaagacc	ttcgtggaac	tgatgaggcg	cggcgatctg		180
cccgtgtggc	tgagttacaa	ggtcgcttca	gagggattcc	agtatatgtga	ccgacggtgg		240
tgctttgatg	gcgaacgcaa	caatcaggtg	ctggaggaga	acatggatgt	cgagatttgg		300
aaaaaggaag	gcgagcggaa	gaaactgcgc	ccacgatggc	tggacgctcg	gacttacagc		360
gatcccctgg	cactgagaga	attcaaagag	tttgctgcag	gg			402

$\langle 210 \rangle$	9
$\langle 211 \rangle$	134
$\langle 212 \rangle$	PRT
$\langle 213 \rangle$	Artificial Sequence

<400> 9

Asn Thr Pro Glu Gly Ile Ile Pro Ala Leu Phe Glu Pro Glu Arg Glu
20 25 30

Lys Ser Ala Ala Ile Asp Gly Glu Tyr Arg Leu Arg Gly Glu Ala Arg
35 40 45

Lys Thr Phe Val Glu Leu Met Arg Arg Gly Asp Leu Pro Val Trp Leu
50 55 60

Ser Tyr Lys Val Ala Ser Glu Gly Phe Gln Tyr Ser Asp Arg Arg Trp
65 70 75 80

Cys Phe Asp Gly Glu Arg Asn Asn Gln Val Leu Glu Glu Asn Met Asp
85 90 95

Val Glu Ile Trp Thr Lys Glu Gly Glu Arg Lys Lys Leu Arg Pro Arg
100 105 110

Trp Leu Asp Ala Arg Thr Tyr Ser Asp Pro Leu Ala Leu Arg Glu Phe
115 120 125

Lys Glu Phe Ala Ala Gly
130

<210> 10
<211> 258
<212> DNA
<213> Artificial Sequence

<220>
<223> Native nucleotide sequence of the polynucleotide encoding the
NS4b fragment of DENV1

<400> 10
gtggctgttg aaaatcacca ccatgccgca atgctggacg tagacttaca tccagcttca 60
gcctggaccc tctatgcagt ggccacaaca attatcactc ccatgatgag gcacacaata 120
gaaaacacaa cggcaaacat ttccctgaca gccattgcaa accaggcggc tatattgatg 180
ggacttgaca aaggatggcc aatatcgaag atggacatag gagttccact tctcgccttg 240
gggtgctatt cccaggtg 258

<210> 11
<211> 258
<212> DNA
<213> Artificial Sequence

<220>

<223> Optimised nucleotide sequence of the polynucleotide encoding the NS4b fragment of DENV1

<400> 11

gtggccgtcg agaatcacca tcacgccgct atgctggacg tggatctgca tcctgccagt 60

gcttggaccc tgtatgcagt ggccactacc atcattaccc caatgatgcg ccacacaatc 120

gagaacacaa ctgccaatat ctactgaca gctattgcaa accaggcagc cattctgatg 180

ggactggaca aaggctggcc catcagcaag atggatattg gcgtgcctct gctggccctg 240

gggtgttaca gtcaggtg 258

<210> 12

<211> 86

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the NS4b fragment of DENV1

<400> 12

Val Ala Val Glu Asn His His His Ala Ala Met Leu Asp Val Asp Leu
1 5 10 15

His Pro Ala Ser Ala Trp Thr Leu Tyr Ala Val Ala Thr Thr Ile Ile
20 25 30

Thr Pro Met Met Arg His Thr Ile Glu Asn Thr Thr Ala Asn Ile Ser
35 40 45

Leu Thr Ala Ile Ala Asn Gln Ala Ala Ile Leu Met Gly Leu Asp Lys
50 55 60

Gly Trp Pro Ile Ser Lys Met Asp Ile Gly Val Pro Leu Leu Ala Leu
65 70 75 80

Gly Cys Tyr Ser Gln Val
85

<210> 13

<211> 402

<212> DNA

<213> Artificial Sequence

<220>

<223> Native nucleotide sequence of the polynucleotide encoding the NS5 fragment of DENV1

<400> 13

```
ctggatatca ttggccagag gatagagaac ataaaacatg aacataagtc aacatggcat      60
tatgatgagg acaatccata taaaacatgg gcctatcacg gatcatatga ggtcaagcca      120
tcaggatcag cctcatccat ggtcaatggc gtgggtgaaac tgctcaccaa accatgggat      180
gtcatcccca tggtcacaca aatagccatg actgacacca caccctttgg acaacagagg      240
gtgttcaaag agaaagttga cacgcgcaca caaaagcaa aacgaggcac agcacaaatc      300
atggaggtga cagccaaatg gttatggggg tttctttcta gaaacaaaaa accaagaatt      360
tgtacaagag aggagttcac aagaaaagtc aggtcaaacg ca                          402
```

<210> 14

<211> 402

<212> DNA

<213> Artificial Sequence

<220>

<223> Optimised nucleotide sequence of the polynucleotide encoding the NS5 fragment of DENV1

<400> 14

```
ctggacatca ttggccagag gatcgagaac attaagcatg agcacaaatc aacctggcat      60
tacgacgaag ataatcccta taagacatgg gcctaccacg gaagctatga ggtgaaacct      120
tcaggcagcg ccagcagcat ggtcaacggg gtgggtcaagc tgctgaccaa accttgggac      180
gtgatcccaa tggtcactca gattgccatg accgatacca cccattcgg ccagcagcgg      240
gtgttcaagg agaaggtgga caccgcaca cctaaggcta aacgagggac tgcacagatc      300
atggaggtga ccgccaagtg gctgtgggga ttcctgtcca ggaacaagaa gccaaagaatc      360
tgtaccaggg aagagttcac aagaaaggtc cggtcaaacg cc                          402
```

<210> 15

<211> 134

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the NS5 fragment of DENV1

<400> 15

Leu Asp Ile Ile Gly Gln Arg Ile Glu Asn Ile Lys His Glu His Lys
1 5 10 15

Ser Thr Trp His Tyr Asp Glu Asp Asn Pro Tyr Lys Thr Trp Ala Tyr
20 25 30

His Gly Ser Tyr Glu Val Lys Pro Ser Gly Ser Ala Ser Ser Met Val
35 40 45

Asn Gly Val Val Lys Leu Leu Thr Lys Pro Trp Asp Val Ile Pro Met
50 55 60

Val Thr Gln Ile Ala Met Thr Asp Thr Thr Pro Phe Gly Gln Gln Arg
65 70 75 80

Val Phe Lys Glu Lys Val Asp Thr Arg Thr Pro Lys Ala Lys Arg Gly
85 90 95

Thr Ala Gln Ile Met Glu Val Thr Ala Lys Trp Leu Trp Gly Phe Leu
100 105 110

Ser Arg Asn Lys Lys Pro Arg Ile Cys Thr Arg Glu Glu Phe Thr Arg
115 120 125

Lys Val Arg Ser Asn Ala
130

<210> 16

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P20 epitope

<400> 16

Leu Pro Glu Ile Glu Asp Glu Val Phe
1 5

<210> 17

<211> 10

<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P19 epitope

<400> 17

His Pro Gly Ser Gly Lys Thr Arg Arg Tyr
1 5 10

<210> 18
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P30 epitope

<400> 18

Arg Tyr Leu Pro Ala Ile Val Arg Glu Ala Ile
1 5 10

<210> 19
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P451 epitope

<400> 19

Tyr Leu Pro Ala Ile Val Arg Glu Ala
1 5

<210> 20
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P11 epitope

<400> 20

Leu Pro Ala Ile Val Arg Glu Ala Ile
1 5

<210> 21
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P36 epitope

<400> 21

Ala Pro Thr Arg Val Val Ala Ser Glu Met
1 5 10

<210> 22
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P48 EPITOPE

<400> 22

Glu Met Ala Glu Ala Leu Lys Gly Met Pro Ile Arg Tyr Gln Thr
1 5 10 15

<210> 23
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P12 epitope

<400> 23

Ser Pro Val Arg Val Pro Asn Tyr Asn Met
1 5 10

<210> 24
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P454 epitope

<400> 24

Val Pro Asn Tyr Asn Met Ile Ile Met
1 5

<210> 25
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P18 epitope

<400> 25

Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr
1 5 10

<210> 26
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P457 epitope

<400> 26

Ala Val Ile Gln Asp Glu Glu Arg Asp Ile
1 5 10

<210> 27
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P453 epitope

<400> 27

Arg Ser Trp Asn Ser Gly Tyr Glu Trp
1 5

<210> 28
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P49 epitope

<400> 28

Thr Pro Glu Gly Ile Ile Pro Ala Leu
1 5

<210> 29
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P28 epitope

<400> 29

Lys Thr Phe Val Glu Leu Met Arg Arg
1 5

<210> 30
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P2 epitope

<400> 30

Glu Leu Met Arg Arg Gly Asp Leu Pro Val
1 5 10

<210> 31
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P450 epitope

<400> 31

Asp Leu Met Arg Arg Gly Asp Leu Pro Val
1 5 10

<210> 32
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P50 epitope

<400> 32

Leu Pro Val Trp Leu Ser Tyr Lys Val Ala
1 5 10

<210> 33

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P32 epitope

<400> 33

Gln Tyr Ser Asp Arg Arg Trp Cys Phe
1 5

<210> 34

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P73 epitope

<400> 34

Asn Tyr Ala Asp Arg Arg Trp Cys Phe
1 5

<210> 35

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P74 epitope

<400> 35

Asn Tyr Ala Asp Arg Lys Trp Cys Phe
1 5

<210> 36

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P75 epitope

<400> 36

Lys Tyr Thr Asp Arg Lys Trp Cys Phe
1 5

<210> 37

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P76 epitope

<400> 37

Ser Tyr Lys Asp Arg Glu Trp Cys Phe
1 5

<210> 38

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P35 epitope

<400> 38

Arg Pro Arg Trp Leu Asp Ala Arg Thr
1 5

<210> 39

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P17 epitope

<400> 39

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

Glu Phe

<210> 40
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P29 epitope

<400> 40

Arg Ile Tyr Ser Asp Pro Leu Ala Leu Lys
1 5 10

<210> 41
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P452 epitope

<400> 41

Arg Thr Tyr Ser Asp Pro Leu Ala Leu Arg
1 5 10

<210> 42
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P21 epitope

<400> 42

His Pro Ala Ser Ala Trp Thr Leu Tyr
1 5

<210> 43
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P16 epitope

<400> 43

Pro Ala Ser Ala Trp Thr Leu Tyr
1 5

<210> 44
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P13 epitope

<400> 44

His Pro Ala Ser Ala Trp Thr Leu Tyr Ala
1 5 10

<210> 45
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P51 epitope

<400> 45

Thr Leu Tyr Ala Val Ala Thr Thr Ile
1 5

<210> 46
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P52 epitope

<400> 46

Val Ala Thr Thr Ile Ile Thr Pro Met
1 5

<210> 47
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P33 epitope

<400> 47

Ile Thr Pro Met Met Arg His Thr Ile
1 5

<210> 48
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P14 epitope

<400> 48

Thr Pro Met Met Arg His Thr Ile Glu Asn
1 5 10

<210> 49
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P22 epitope

<400> 49

Ile Ala Asn Gln Ala Ala Ile Leu Met
1 5

<210> 50
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P456 epitope

<400> 50

Ala Ala Ile Leu Met Gly Leu Asp Lys
1 5

<210> 51
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P53 epitope

<400> 51

Lys Met Asp Ile Gly Val Pro Leu Leu
1 5

<210> 52

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P54 epitope

<400> 52

Val Pro Leu Leu Ala Leu Gly Cys Tyr
1 5

<210> 53

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P55 epitope

<400> 53

Asp Asn Pro Tyr Lys Thr Trp Ala Tyr His
1 5 10

<210> 54

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P24 epitope

<400> 54

Trp Ala Tyr His Gly Ser Tyr Glu Val
1 5

<210> 55

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P56 epitope

<400> 55

Ser Met Val Asn Gly Val Val Lys Leu
1 5

<210> 56

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P5 epitope

<400> 56

Leu Leu Thr Lys Pro Trp Asp Val Ile Pro Met Val Thr Gln Ile
1 5 10 15

<210> 57

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P6 epitope

<400> 57

Leu Leu Thr Lys Pro Trp Asp Val Ile Pro
1 5 10

<210> 58

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P7 epitope

<400> 58

Leu Thr Lys Pro Trp Asp Val Ile Pro Met
1 5 10

<210> 59

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P8 epitope

<400> 59

Thr	Lys	Pro	Trp	Asp	Val	Ile	Pro	Met	Val
1				5					10

<210> 60

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P9 epitope

<400> 60

Lys	Pro	Trp	Asp	Val	Ile	Pro	Met	Val	Thr
1				5					10

<210> 61

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P10 epitope

<400> 61

Pro	Trp	Asp	Val	Ile	Pro	Met	Val	Thr	Gln
1				5					10

<210> 62

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the P27 epitope

<400> 62

Trp	Asp	Val	Ile	Pro	Met	Val	Thr	Gln	Ile
1				5					10

<210> 63

<211> 9

<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P455 epitope

<400> 63

Ile Pro Met Val Thr Gln Ile Ala Met
1 5

<210> 64
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P34 epitope

<400> 64

Asp Thr Thr Pro Phe Gly Gln Gln Arg
1 5

<210> 65
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P23 epitope

<400> 65

Thr Pro Phe Gly Gln Gln Arg Val Phe
1 5

<210> 66
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P3 epitope

<400> 66

Thr Ala Lys Trp Leu Trp Gly Phe Leu Ser Arg Asn Lys Lys Pro Arg
1 5 10 15

Ile Cys Thr Arg
20

<210> 67
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P4 epitope

<400> 67

Trp Gly Phe Leu Ser Arg Asn Lys Lys
1 5

<210> 68
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the P15 epitope

<400> 68

Lys Pro Arg Ile Cys Thr Arg Glu Glu Phe
1 5 10

<210> 69
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the peptide at position 8-22 of the first region of NS3

<400> 69

Pro Glu Leu Glu Glu Glu Met Phe Lys Lys Arg Asn Leu Thr Ile
1 5 10 15

<210> 70
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the peptide at position 18-32 of the first

region of NS3

<400> 70

Arg	Lys	Leu	Thr	Ile	Met	Asp	Leu	His	Pro	Gly	Ser	Gly	Lys	Thr
1				5					10					15

<210> 71

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the peptide at position 32-46 of the first region of NS3

<400> 71

Thr	Lys	Arg	Tyr	Leu	Pro	Ala	Ile	Val	Arg	Glu	Ala	Ile	Lys	Arg
1				5					10					15

<210> 72

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the peptide at position 33-42 of the first region of NS3

<400> 72

Arg	Lys	Tyr	Leu	Pro	Ala	Ile	Val	Arg	Glu
1				5					10

<210> 73

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the peptide at position 36-50 of the first region of NS3

<400> 73

Leu	Pro	Ala	Ile	Val	Arg	Glu	Ala	Ile	Lys	Arg	Arg	Leu	Arg	Thr
1				5					10					15

<210> 74

<211> 15
<212> PRT
<213> Artificial Sequence

<220>

<223> Amino acid sequence of the peptide at position 40-54 of the first region of NS3

<400> 74

Val	Arg	Glu	Ala	Ile	Lys	Arg	Arg	Leu	Arg	Thr	Leu	Ile	Leu	Ala
1				5				10					15	

<210> 75
<211> 11
<212> PRT
<213> Artificial Sequence

<220>

<223> Amino acid sequence of the peptide at position 56-66 of the first region of NS3

<400> 75

Thr	Arg	Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala
1				5				10		

<210> 76
<211> 15
<212> PRT
<213> Artificial Sequence

<220>

<223> Amino acid sequence of the peptide at position 55-69 of the first region of NS3

<400> 76

Pro	Thr	Arg	Val	Val	Ala	Ala	Glu	Met	Glu	Glu	Ala	Met	Lys	Gly
1				5				10					15	

<210> 77
<211> 15
<212> PRT
<213> Artificial Sequence

<220>

<223> Amino acid sequence of the peptide at position 66-80 of the first region of NS3

<400> 77

Ala Leu Lys Gly Met Pro Ile Arg Tyr Gln Thr Thr Ala Val Lys
1 5 10 15

<210> 78
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the peptide at position 68-82 of the first
region of NS3

<400> 78

Lys Gly Leu Pro Ile Arg Tyr Gln Thr Thr Ala Thr Lys Ser Glu
1 5 10 15

<210> 79
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the peptide at position 72-86 of the first
region of NS3

<400> 79

Ile Arg Tyr Gln Thr Thr Ala Thr Lys Ser Glu His Thr Gly Arg
1 5 10 15

<210> 80
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the peptide at position 83-97 of the first
region of NS3

<400> 80

His Thr Gly Arg Glu Ile Val Asp Leu Met Cys His Ala Thr Glu
1 5 10 15

<210> 81
<211> 12
<212> PRT
<213> Artificial Sequence

<220>

<223> Amino acid sequence of the peptide at position 86-97 of the first region of NS3

<400> 81

Arg Glu Ile Val Asp Leu Met Cys His Ala Thr Phe
1 5 10

<210> 82

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the peptide at position 87-96 of the first region of NS3

<400> 82

Glu Ile Val Asp Leu Met Cys His Ala Thr
1 5 10

<210> 83

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the peptide at position 89-98 of the first region of NS3

<400> 83

Val Asp Leu Met Cys His Ala Thr Phe Thr
1 5 10

<210> 84

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the peptide at position 96-110 of the first region of NS3

<400> 84

Thr Phe Thr Met Arg Leu Leu Ser Pro Val Arg Val Pro Asn Tyr
1 5 10 15

<210> 85
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the peptide at position 108-122 of the first region of NS3

<400> 85

Pro Asn Tyr Asn Leu Ile Ile Met Asp Glu Ala His Phe Thr Asp
1 5 10 15

<210> 86
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the peptide at position 124-138 of the first region of NS3

<400> 86

Ala Ser Ile Ala Ala Arg Gly Tyr Ile Ser Thr Arg Val Gly Met
1 5 10 15

<210> 87
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the peptide at position 139-154 of the first region of NS3

<400> 87

Glu Ala Ala Ala Ile Phe Met Thr Ala Thr Pro Pro Gly Thr Ala
1 5 10 15

<210> 88
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the peptide at position 287-301 of the

second region of NS3

<400> 88

Arg	Glu	Gly	Glu	Lys	Lys	Lys	Leu	Arg	Pro	Arg	Trp	Leu	Asp	Arg
1				5					10				15	

<210> 89

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the peptide at position 307-319 of the second region of NS3

<400> 89

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

<210> 90

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the peptide at position 417-433 of NS5

<400> 90

Lys	Glu	Glu	His	Ser	Ser	Thr	Trp	His	Tyr	Asp	Asp	Glu	Asn	Pro	Tyr
1				5					10					15	

Lys

<210> 91

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the peptide at position 423-439 of NS5

<400> 91

Thr	Trp	His	Tyr	Asp	Asp	Glu	Asn	Pro	Tyr	Lys	Thr	Trp	Ala	Tyr	His
1				5					10					15	

Gly

<210> 92
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the peptide at position 427-444 of NS5

<400> 92

Asp	Glu	Asn	Pro	Tyr	Lys	Thr	Trp	Ala	Tyr	His	Gly	Ser	Tyr	Glu	Val
1				5				10						15	

Lys

<210> 93
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the peptide at position 433-447 of NS5

<400> 93

Lys	Thr	Trp	Ala	Tyr	His	Gly	Ser	Tyr	Glu	Thr	Lys	Gln	Thr	Gly
1				5					10					15

<210> 94
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the peptide at position 451-473 of NS5

<400> 94

Ser	Met	Ile	Asn	Gly	Val	Val	Lys	Leu	Leu	Thr	Lys	Pro	Trp	Asp	Val
1				5				10						15	

Val

<210> 95
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the peptide at position 462-471 of NS5

<400> 95

Lys Pro Trp Asp Val Leu Pro Met Val
1 5

<210> 96
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the peptide at position 457-463 of NS5

<400> 96

Val Lys Leu Leu Thr Lys Pro Trp Asp Val Val Pro Met Val Thr Gln
1 5 10 15

Met

<210> 97
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the peptide at position 469-485 of NS5

<400> 97

Met Val Thr Gln Met Ala Met Thr Asp Thr Thr Pro Phe Gly Gln Gln
1 5 10 15

Arg Val

<210> 98
<211> 15
<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 98

Val	Lys	Ser	Glu	His	Thr	Gly	Lys	Glu	Ile	Val	Asp	Leu	Met	Cys
1				5					10					15

<210> 99

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 99

His	Thr	Gly	Lys	Glu	Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe
1				5					10					15

<210> 100

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 100

Glu	Ile	Val	Asp	Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Met	Arg	Leu
1				5					10					15

<210> 101

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 101

Leu	Met	Cys	His	Ala	Thr	Phe	Thr	Met	Arg	Leu	Leu	Ser	Pro	Val
1				5					10					15

<210> 102

<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 102

Ala	Thr	Phe	Thr	Met	Arg	Leu	Leu	Ser	Pro	Val	Arg	Val	Pro	Asn
1				5					10					15

<210> 103
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 103

Met	Arg	Leu	Leu	Ser	Pro	Val	Arg	Val	Pro	Asn	Tyr	Asn	Met	Ile
1				5					10					15

<210> 104
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 104

Glu	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Val	Ala	Val	Glu	Asn	His	His
1				5					10					15

<210> 105
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 105

Phe	Ala	Ala	Gly	Val	Ala	Val	Glu	Asn	His	His	His	Ala	Ala	Met
1				5					10					15

<210> 106
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 106

Val	Ala	Val	Glu	Asn	His	His	His	Ala	Ala	Met	Leu	Asp	Val	Asp
1				5					10					15

<210> 107
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 107

Asn	His	His	His	Ala	Ala	Met	Leu	Asp	Val	Asp	Leu	His	Pro	Ala
1				5					10					15

<210> 108
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 108

Ala	Ala	Met	Leu	Asp	Val	Asp	Leu	His	Pro	Ala	Ser	Ala	Trp	Thr
1				5					10					15

<210> 109
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 109

Asp Val Asp Leu His Pro Ala Ser Ala Trp Thr Leu Tyr Ala Val

1	5	10	15
---	---	----	----

<210> 110
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic peptide

<400> 110

His	Pro	Ala	Ser	Ala	Trp	Thr	Leu	Tyr	Ala	Val	Ala	Thr	Thr	Ile
1				5					10					15

<210> 111
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic peptide

<400> 111

Ala	Trp	Thr	Leu	Tyr	Ala	Val	Ala	Thr	Thr	Ile	Ile	Thr	Pro	Met
1				5					10					15

<210> 112
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic peptide

<400> 112

Tyr	Ala	Val	Ala	Thr	Thr	Ile	Ile	Thr	Pro	Met	Met	Arg	His	Thr
1				5					10					15

<210> 113
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic peptide

<400> 113

Thr Thr Ile Ile Thr Pro Met Met Arg His Thr Ile Glu Asn Thr
1 5 10 15

<210> 114
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 114

Thr Pro Met Met Arg His Thr Ile Glu Asn Thr Thr Ala Asn Ile
1 5 10 15

<210> 115
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 115

Arg His Thr Ile Glu Asn Thr Thr Ala Asn Ile Ser Leu Thr Ala
1 5 10 15

<210> 116
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 116

Glu Asn Thr Thr Ala Asn Ile Ser Leu Thr Ala Ile Ala Asn Gln
1 5 10 15

<210> 117
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 117

Ala	Asn	Ile	Ser	Leu	Thr	Ala	Ile	Ala	Asn	Gln	Ala	Ala	Ile	Leu
1				5					10					15

<210> 118

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 118

Gly	Trp	Pro	Ile	Ser	Lys	Met	Asp	Ile	Gly	Val	Pro	Leu	Leu	Ala
1				5					10					15

<210> 119

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 119

Ser	Lys	Met	Asp	Ile	Gly	Val	Pro	Leu	Leu	Ala	Leu	Gly	Cys	Tyr
1				5					10					15

<210> 120

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 120

Ile	Gly	Val	Pro	Leu	Leu	Ala	Leu	Gly	Cys	Tyr	Ser	Gln	Val	Leu
1				5					10					15

<210> 121

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 121

Asp	Glu	Asp	Asn	Pro	Tyr	Lys	Thr	Trp	Ala	Tyr	His	Gly	Ser	Tyr
1				5					10					15

<210> 122

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 122

Pro	Tyr	Lys	Thr	Trp	Ala	Tyr	His	Gly	Ser	Tyr	Glu	Val	Lys	Pro
1				5					10					15

<210> 123

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 123

Trp	Ala	Tyr	His	Gly	Ser	Tyr	Glu	Val	Lys	Pro	Ser	Gly	Ser	Ala
1				5					10					15

<210> 124

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 124

Gly	Ser	Tyr	Glu	Val	Lys	Pro	Ser	Gly	Ser	Ala	Ser	Ser	Met	Val
1				5					10					15

<210> 125

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 125

Val	Lys	Pro	Ser	Gly	Ser	Ala	Ser	Ser	Met	Val	Asn	Gly	Val	Val
1				5					10					15

<210> 126

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 126

Gly	Ser	Ala	Ser	Ser	Met	Val	Asn	Gly	Val	Val	Lys	Leu	Leu	Thr
1				5					10					15

<210> 127

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 127

Ser	Met	Val	Asn	Gly	Val	Val	Lys	Leu	Leu	Thr	Lys	Pro	Trp	Asp
1				5					10					15

<210> 128

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic peptide

<400> 128

Gly	Val	Val	Lys	Leu	Leu	Thr	Lys	Pro	Trp	Asp	Val	Ile	Pro	Met
1				5					10					15

<210> 129

<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 129

Leu	Leu	Thr	Lys	Pro	Trp	Asp	Val	Ile	Pro	Met	Val	Thr	Gln	Ile
1				5					10					15

<210> 130
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 130

Pro	Trp	Asp	Val	Ile	Pro	Met	Val	Thr	Gln	Ile	Ala	Met	Thr	Asp
1				5					10					15

<210> 131
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 131

Ile	Pro	Met	Val	Thr	Gln	Ile	Ala	Met	Thr	Asp	Thr	Thr	Pro	Phe
1				5					10					15

<210> 132
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 132

Thr	Gln	Ile	Ala	Met	Thr	Asp	Thr	Thr	Pro	Phe	Gly	Gln	Gln	Arg
1				5					10					15

<210> 133
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 133

Met	Thr	Asp	Thr	Thr	Pro	Phe	Gly	Gln	Gln	Arg	Val	Phe	Lys	Glu
1				5					10					15

<210> 134
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 134

Phe	Thr	Met	Arg	Leu	Leu	Ser	Pro	Val
1				5				

<210> 135
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 135

Val	Ala	Val	Glu	Asn	His	His	His	Ala	Ala	Met
1				5					10	

<210> 136
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 136

Leu Tyr Ala Val Ala Thr Thr Ile Ile

1

5

<210> 137
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 137

Thr Ala Ile Ala Asn Gln Ala Ala Ile
1 5

<210> 138
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide

<400> 138

Ser Ser Met Val Asn Gly Val Val Lys Leu
1 5 10

<210> 139
<211> 22363
<212> DNA
<213> Artificial Sequence

<220>
<223> Complete optimised nucleotide sequence of the polynucleotide
encoding pTM-MVDVax6

<220>
<221> misc_feature
<222> (1)..(8)
<223> NotI

<220>
<221> misc_feature
<222> (9)..(28)
<223> T7 promoter

<220>
<221> misc_feature
<222> (29)..(82)

<223> Hammerhead ribozyme

 <220>
 <221> misc_feature
 <222> (83)..(189)
 <223> MV Leader and N promoter

 <220>
 <221> misc_feature
 <222> (190)..(1767)
 <223> MV N ORF

 <220>
 <221> misc_feature
 <222> (1768)..(1888)
 <223> MV N-P intergenic

 <220>
 <221> misc_feature
 <222> (1889)..(3412)
 <223> MV P ORF

 <220>
 <221> misc_feature
 <222> (3413)..(3531)
 <223> MV ATU2

 <220>
 <221> misc_feature
 <222> (3532)..(5085)
 <223> DENV tetra EDIII + ectoM

 <220>
 <221> misc_feature
 <222> (5086)..(5181)
 <223> MV P-M intergenic

 <220>
 <221> misc_feature
 <222> (5182)..(6189)
 <223> MV M ORF

 <220>
 <221> misc_feature
 <222> (6190)..(7192)
 <223> MV M-F intergenic

 <220>
 <221> misc_feature
 <222> (7193)..(8854)
 <223> MV F ORF

 <220>
 <221> misc_feature

```

<222> (8855)..(9014)
<223> MV-F-H intergenic

<220>
<221> misc_feature
<222> (9015)..(10868)
<223> MV H ORF

<220>
<221> misc_feature
<222> (10869)..(10995)
<223> MV ATU3

<220>
<221> misc_feature
<222> (10996)..(12618)
<223> DENV1 NS polyepitope

<220>
<221> misc_feature
<222> (12619)..(12712)
<223> MV H-L intergenic

<220>
<221> misc_feature
<222> (12713)..(19263)
<223> MV L ORF

<220>
<221> misc_feature
<222> (19264)..(19372)
<223> MV Trailer

<220>
<221> misc_feature
<222> (19373)..(19456)
<223> HDV ribozyme

<220>
<221> misc_feature
<222> (19457)..(19598)
<223> T7 terminator

<220>
<221> misc_feature
<222> (19599)..(19606)
<223> Not I

<220>
<221> misc_feature
<222> (19607)..(22363)
<223> pTM plasmid

<400> 139

```

gcggccgcta atacgactca ctatagggcc aactttgttt ggtctgatga gtccgtgagg	60
acgaaacccg gagtcccggg tcaccaaaca aagttgggta aggatagttc aatcaatgat	120
catcttctag tgcacttagg attcaagatc ctattatcag ggacaagagc aggattaggg	180
atatccgaga tggccacact ttttaaggagc ttagcattgt tcaaaagaaa caaggacaaa	240
ccaccatta catcaggatc cgggtggagcc atcagaggaa tcaaacacat tattatagta	300
ccaatccctg gagattcctc aattaccact cgatccagac ttctggaccg gttggtgagg	360
ttaattggaa acccggatgt gagcggggcc aaactaacag gggcactaat aggtatatta	420
tccttatttg tggagtctcc aggtcaattg attcagagga tcaccgatga ccctgacgtt	480
agcataaggc tgttagaggt tgtccagagt gaccagtcac aatctggcct taccttcgca	540
tcaagaggta ccaacatgga ggatgaggcg gaccaatact tttcacatga tgatccaatt	600
agtagtgatc aatccagggt cggatgggtc gggaacaagg aaatctcaga tattgaagtg	660
caagaccctg agggtattca catgattctg ggtaccatcc tagcccaaatt ttgggtcttg	720
ctcgcaaagg cggttacggc cccagacacg gcagctgatt cggagctaag aaggtggata	780
aagtacaccc aacaaagaag ggtagttggg gaatttagat tggagagaaa atggttggat	840
gtggtgagga acaggattgc cgaggacctc tccttacgcc gattcatggt cgctctaadc	900
ctggatatca agagaacacc cggaaacaaa cccaggattg ctgaaatgat atgtgacatt	960
gatacatata tcgtagaggc aggattagcc agttttatcc tgactattaa gtttgggata	1020
gaaactatgt atcctgctct tggactgcat gaatttgctg gtgagttatc cacacttgag	1080
tccttgatga acctttacca gcaaattggg gaaactgcac cctacatggt aatcctggag	1140
aactcaattc agaacaagtt cagtgcagga tcataccctc tgctctggag ctatgccatg	1200
ggagtaggag tggaacttga aaactccatg ggaggtttga actttggccg atcttacttt	1260
gatccagcat attttagatt agggcaagag atggtaagga ggtcagctgg aaaggtcagt	1320
tccacattgg catctgaact cggatatcact gccgaggatg caaggcttgt ttcagagatt	1380
gcaatgcata ctactgagga caagatcagt agagcggttg gaccagaca agcccaagta	1440
tcatttctac acggtgatca aagtgagaat gagctaccga gattgggggg caaggaagat	1500
aggaggggtca aacagagtcg aggagaagcc agggagagct acagagaaac cgggccagc	1560
agagcaagtg atgcgagagc tgcccatctt ccaaccggca caccctaga cattgacact	1620

gcaacggagt ccagccaaga tccgcaggac agtcgaaggt cagctgacgc cctgcttagg	1680
ctgcaagcca tggcaggaat ctcggaagaa caaggctcag acacggacac ccctatagtg	1740
tacaatgaca gaaatcttct agactaggtg cgagaggccg agggccagaa caacatccgc	1800
ctaccatcca tcattgttat aaaaaactta ggaaccaggt ccacacagcc gccagcccat	1860
caaccatcca ctcccacgat tggagccaat ggcagaagag caggcacgcc atgtcaaaaa	1920
cggactggaa tgcatccggg ctctcaaggc cgagcccatc ggctcactgg ccatcgagga	1980
agctatggca gcatggctcag aaatatcaga caaccagga caggagcgag ccacctgcag	2040
ggaagagaag gcaggcagtt cgggtctcag caaacatgc ctctcagcaa ttgatcaac	2100
tgaaggcggg gcacctcgca tccgcgggtca gggacctgga gagagcgatg acgacgtga	2160
aactttggga atcccccaa gaaatctcca ggcataagc actgggttac agtgttatta	2220
cgtttatgat cacagcgggtg aagcgggttaa gggaatccaa gatgctgact ctatcatggt	2280
tcaatcaggc cttgatgggtg atagcaccct ctcaggagga gacaatgaat ctgaaaacag	2340
cgatgtggat attggcgaac ctgataccga gggatatgct atcactgacc ggggatctgc	2400
tcccatctct atgggggttca gggcttctga tgttgaaact gcagaaggag gggagatcca	2460
cgagctcctg agactccaat ccagaggcaa caactttccg aagcttggga aaactctcaa	2520
tgttcctccg ccccgacc ccggtagggc cagcacttcc gggacacca ttaaaaagg	2580
cacagacgcg agattagcct ctttggaac ggagatcgcg tctttattga cagggtggtgc	2640
aaccaatgt gtcgaaagt caccctcgga accatcaggg ccaggtgcac ctgcggggaa	2700
tgtccccgag tgtgtgagca atgccgcact gatacaggag tggacacccg aatctggtac	2760
cacaatctcc ccgagatccc agaataatga agaaggggga gactattatg atgatgagct	2820
gttctctgat gtccaagata ttaaaacagc cttggccaaa atacacgagg ataatacagaa	2880
gataatctcc aagctagaat cactgctgtt attgaaggga gaagttgagt caattaagaa	2940
gcagatcaac aggcaaaata tcagcatatc caccctggaa ggacacctct caagcatcat	3000
gatcgccatt cctggacttg ggaaggatcc caacgacccc actgcagatg tcgaaatcaa	3060
tcccgacttg aaacccatca taggcagaga ttcaggccga gcactggccg aagttctcaa	3120
gaaaccggt gccagccgac aactccaagg aatgacaaat ggacggacca gttccagagg	3180
acagctgctg aaggaatttc agctaaagcc gatcgggaaa aagatgagct cagccgtcgg	3240

gtttgttcct gacaccggcc ctgcatcacg cagtgtaatc cgctccatta taaaatccag	3300
ccggctagag gaggatcgga agcgttacct gatgactctc cttgatgata tcaaaggagc	3360
caatgatctt gccaaagttcc accagatgct gatgaagata ataatgaagt agctacagct	3420
caacttacct gccaacccca tgccagtcga cccaactagc ctaccctcca tcattgttat	3480
aaaaaactta ggaaccaggt ccacacagcc gccagcccat caacgcgtac gatgggcatc	3540
atattcattc ttcttatgct ggttacaccg tctatggcgg agaaacttcg aatcaaaggt	3600
atgagctata cgatgtgcag cggcaagttc aagatcgaga aggaaatggc tgaaaccag	3660
cacggtacaa ctgtgggtcaa agtcaaatat gagggggctg gcgctccctg taaagtaccc	3720
attgagatta gggacgtcaa taaagagaag gtggtaggtc gcatcatctc cagtacacct	3780
ttggccgaga acacgaactc cgtcacaaac atagagttgg aacccccgtt cggagactca	3840
tacattgtga tcgggggtggg caactctgca ctcacactgc attggttcaa gaagggaagc	3900
agtatcggcc gcagggataa gagagacaaa ctgaaattga aaggtatgtc ctatgccatg	3960
tgcacgaata ctttcgttct caagaaagaa gtatctgaga ctcagcacgg aaccatcctg	4020
atcaaagtcg agtacaaagg agaagacgtg ccctgtaaga tcccattcag taccgaggat	4080
ggacagggca agggccataa cggcaggctg ataaccgcca accctgtggt tacaagaag	4140
gaagagccag tcaatatcga agctgagcca ccgttcgggg agagcaacat agtaattggc	4200
ataggggata atgctttgaa gatcaactgg tacaagaaag gaagctccat tggccgaaga	4260
gataagcgcg acaaactcca gctgaaagga atgagctact ccatgtgtac tgggaagttc	4320
aagattgtca aggaaatcgc cgaaactcag catggcacta ttgtgatccg cgtgcagtat	4380
gaaggcgatg gtagcccctg caagatacca tttgaaatca ccgatttgga gaaacggcac	4440
gtcctgggtc ggctcattac cgtgaacca atcgtgaccg agaaggacag tccagttaat	4500
atcgaggccg agcctccttt cggcgacagt tacatcattg taggggtgga accagggcaa	4560
ctgaagctga actggttcaa gaaaggcagc agtataggac ggcgggataa acgggacaaa	4620
ctcacactga aaggcatgtc atacgttatg tgcaccggct cattcaaact ggagaaggaa	4680
gttgacagaga cacagcatgg gaccgtgctc gtgcagggtca aatacgaggg caccgacgct	4740
ccttgcaaga ttccgttcag tacacaggac gagaaaggcg tgactcagaa cggcagattg	4800
attacagcga accctatcgt gactgacaag gagaagccag ttaacatcga gactgagccg	4860

cctttcggag aatcatacat tatcgtggga gccggcgaga aggcactgaa actcagctgg	4920
ttcaagaagg gcagctcaat cggtcggaga gacaagcggc ctgtcgccct cgcaccgcac	4980
gtgggcctgg gtctggaaac gaggaccgag acgtggatga gttccgaagg cgcattggaag	5040
caaattccaga aagtggagac gtggggccctc aggcattccgt aatgagcgcg cagcgcttag	5100
acgtctcgcg atcgatacta gtacaacctt aatccattat aaaaaactta ggagcaaagt	5160
gattgcctcc caaggtccac aatgacagag acctacgact tcgacaagtc ggcatgggac	5220
atcaaagggt cgatcgctcc gatacaacct accacctaca gtgatggcag gctggtgccc	5280
caggtcagag tcatagatcc tggcttaggc gacaggaagg atgaatgctt tatgtacatg	5340
tttctgctgg gggttgttga ggacagcgat tccctagggc ctccaatcgg gcgagcattt	5400
gggttcctgc ccttaggtgt tggcagatcc acagcaaagc ccgaaaaact cctcaaagag	5460
gccactgagc ttgacatagt tgtagacgt acagcagggc tcaatgaaaa actggtgttc	5520
tacaacaaca cccactaac tctcctcaca ccttgagaa aggtcctaac aacagggagt	5580
gtcttcaacg caaaccaagt gtgcaatgcg gttaatctga taccgctcga taccgccgag	5640
aggttccgtg ttgtttatat gagcatcacc cgtctttcgg ataacgggta ttacaccgtt	5700
cctagaagaa tgctggaatt cagatcggtc aatgcagtgg ctttcaacct gctggtgacc	5760
cttaggattg acaaggcgat aggccctggg aagatcatcg acaatacaga gcaacttcct	5820
gaggcaacat ttatggtcca catcgggaac ttcaggagaa agaagagtga agtctactct	5880
gccgattatt gcaaaatgaa aatcgaaaag atgggcctgg tttttgcact tgggtgggata	5940
gggggcacca gtcttcacat tagaagcaca ggcaaatga gcaagactct ccatgcacaa	6000
ctcgggttca agaagacctt atgttaccg ctgatggata tcaatgaaga ctttaatcga	6060
ttactctgga ggagcagatg caagatagta agaattcagg cagttttgca gccatcagtt	6120
cctcaagaat tccgcattta cgacgacgtg atcataaatg atgaccaagg actattcaaa	6180
gttctgtaga ccgtagtgcc cagcaatgcc cgaaaacgac cccctcaca atgacagcca	6240
gaaggcccgg acaaaaaagc cccctccgaa agactccacg gaccaagcga gaggccagcc	6300
agcagccgac ggcaagcgcg aacaccaggc ggccccagca cagaacagcc ctgacacaag	6360
gccaccacca gccaccccaa tctgcatcct cctcgtggga ccccgagga ccaaccccca	6420
aggctgcccc cgatccaaac caccaaccgc atccccacca ccccgaggaa agaaaccccc	6480

agcaattgga	aggccccctcc	ccctcttcct	caacacaaga	actccacaac	cgaaccgcac	6540
aagcgaccga	ggtgacccaa	ccgcaggcat	ccgactccct	agacagatcc	tctctccccg	6600
gcaaactaaa	caaaacttag	ggccaaggaa	catacacacc	caacagaacc	cagacccccg	6660
cccacggcgc	cgcgccccca	acccccgaca	accagaggga	gcccccaacc	aatccccgcc	6720
gctcccccg	tgcccacagg	cagggacacc	aacccccgaa	cagaccagc	acccaaccat	6780
cgacaatcca	agacgggggg	gccccccaa	aaaaaggccc	ccaggggccg	acagccagca	6840
ccgcgaggaa	gcccaccac	cccacacacg	accacggcaa	ccaaaccaga	accagacca	6900
ccctggggcca	ccagctccca	gactcggcca	tcaccccgc	gaaaggaaag	gccacaaccc	6960
gcgcacccca	gccccgatcc	ggcggggagc	cacccaaccc	gaaccagcac	ccaagagcga	7020
tccccgaagg	acccccgaac	cgcaaaggac	atcagtatcc	cacagcctct	ccaagtcccc	7080
cggctctctc	ctcttctcga	agggaccaa	agatcaatcc	accacacccg	acgacactca	7140
actccccacc	cctaaaggag	acaccgggaa	tcccagaatc	aagactcatc	caatgtccat	7200
catgggtctc	aaggtgaacg	tctctgccat	attcatggca	gtactgttaa	ctctccaaac	7260
accacccggt	caaatccatt	ggggcaatct	ctctaagata	ggggtggtag	gaataggaag	7320
tgcaagctac	aaagttatga	ctcgttccag	ccatcaatca	ttagtcataa	aattaatgcc	7380
caatataact	ctcctcaata	actgcacgag	ggtagagatt	gcagaataca	ggagactact	7440
gagaacagtt	ttggaaccaa	ttagagatgc	acttaatgca	atgaccaga	atataagacc	7500
ggttcagagt	gtagcttcaa	gtaggagaca	caagagattt	gcgggagtag	tcctggcagg	7560
tgcgggcccta	ggcgttgcca	cagctgctca	gataacagcc	ggcattgcac	ttcaccagtc	7620
catgctgaac	tctcaagcca	tcgacaatct	gagagcgagc	ctggaaacta	ctaatacaggc	7680
aattgagaca	atcagacaag	cagggcagga	gatgatattg	gctgttcagg	gtgtccaaga	7740
ctacatcaat	aatgagctga	taccgtctat	gaaccaacta	tcttgtgatt	taatcggcca	7800
gaagctcggg	ctcaaattgc	tcagatacta	tacagaaatc	ctgtcattat	ttggccccag	7860
tttacggggac	cccataatctg	cggagatatc	tatccaggct	ttgagctatg	cgcttgagg	7920
agacatcaat	aaggtgtag	aaaagctcgg	atacagtgga	ggtgatttac	tgggcatctt	7980
agagagcgga	ggaataaagg	cccggataac	tcacgtcgac	acagagtcct	acttcattgt	8040
cctcagtata	gcctatccga	cgctgtccga	gattaagggg	gtgattgtcc	accggctaga	8100

gggggtctcg tacaacatag gctctcaaga gtggtataacc actgtgcca agtatgttgc	8160
aacccaaggg taccttatct cgaattttga tgagtcacgc tgtactttca tgccagaggg	8220
gactgtgtgc agccaaaatg ccttgtagcc gatgagtcct ctgctccaag aatgcctccg	8280
ggggtacacc aagtcctgtg ctcgtacact cgtatccggg tcttttgga accggttcat	8340
tttatcacia gggaacctaa tagccaattg tgcataatc ctttgcaagt gttacacaa	8400
aggaacgacg attaatcaag accctgacaa gatcctaaca tacattgctg ccgatactg	8460
cccggtagtc gaggtgaacg gcgtgacct ccaagtcggg agcaggaggt atccagacgc	8520
tgtgtacttg cacagaattg acctcggtcc tcccatatca ttggagaggt tggacgtagg	8580
gacaaatctg gggaatgcaa ttgctaagtt ggaggatgcc aaggaattgt tggagtcac	8640
ggaccagata ttgaggagta tgaaagggtt atcgagcact agcatagtct acatcctgat	8700
tgcatgtgtg cttggagggt tgatagggat ccccgcttta atatgttgct gcagggggcg	8760
ttgtaacaaa aaggagaaac aagttggtat gtcaagacca ggcctaaagc ctgatcttac	8820
gggaacatca aaatcctatg taaggctgct ctgatcctct acaactcttg aaacacaaat	8880
gtcccacaag tctcctcttc gtcataagc aaccaccgca ccagcatca agcccacctg	8940
aaattatctc cggcttcctt ctggccgaac aatatcggtg gttaatcaaa acttaggggtg	9000
caagatcatc cacaatgtca ccacaacgag accggataaa tgccttctac aaagataacc	9060
cccatcccaa gggaagtagg atagtcatta acagagaaca tcttatgatt gatagacctt	9120
atgttttgct ggctgttctg tttgtcatgt ttctgagctt gatcgggttg ctagccattg	9180
caggcattag acttcatcgg gcagccatct acaccgcaga gatccataaa agcctcagca	9240
ccaatctaga tgtaactaac tcaatcgagc atcagggtcaa ggacgtgctg acaccactct	9300
tcaaaatcat cggtgatgaa gtgggcctga ggacacctca gagattcact gacctagtga	9360
aattaatctc tgacaagatt aaattcctta atccggatag ggagtacgac ttcagagatc	9420
tcacttggtg tatcaacccg ccagagagaa tcaaattgga ttatgatcaa tactgtgcag	9480
atgtggctgc tgaagagctc atgaatgcat tggatgaactc aactctactg gagaccagaa	9540
caaccaatca gttcctagct gtctcaaagg gaaactgctc agggcccact acaatcagag	9600
gtcaattctc aaacatgtcg ctgtccctgt tagacttgta tttagggtcg ggttacaatg	9660
tgcatctat agtcactatg acatcccagg gaatgtatgg gggaacttac ctagtggaaa	9720

agcctaattct gagcagcaaa aggtcagagt tgtcacaact gagcatgtac cgagtgtttg	9780
aagtaggtgt tatcagaaat ccgggttttg gggctccggt gttccatatg acaaactatc	9840
ttgagcaacc agtcagtaat gatctcagca actgtatggt ggctttgggg gagctcaaac	9900
tcgcagccct ttgtcacggg gaagattcta tcacaattcc ctatcaggga tcagggaag	9960
gtgtcagctt ccagctcgtc aagctaggtg tctggaaatc cccaaccgac atgcaatcct	10020
gggtccctt atcaacggat gatccagtga tagacaggct ttaccttca tctcacagag	10080
gtgttatcgc tgacaatcaa gcaaatggg ctgtcccgac aacacgaaca gatgacaagt	10140
tgcgaaatgga gacatgcttc caacaggcgt gtaagggtaa aatccaagca ctctgcgaga	10200
atcccgagtg ggcaccattg aaggataaca ggattccttc atacggggtc ttgtctgttg	10260
atctgagtct gacagttgag cttaaaatca aaattgcttc gggattcggg ccattgatca	10320
cacacggttc agggatggac ctatacaaat ccaaccacaa caatgtgtat tggctgacta	10380
tcccgcaat gaagaaccta gccttaggtg taatcaacac attggagtgg ataccgagat	10440
tcaaggttag tccctacctc ttactgtcc caattaagga agcaggcgaa gactgccatg	10500
ccccaacata cctacctgcg gaggtggatg gtgatgtcaa actcagttcc aatctggtga	10560
ttctacctgg tcaagatctc caatatgttt tggcaacctc cgatacttcc agggttgaac	10620
atgctgtggt ttattacgtt tacagcccaa gccgctcatt ttcttacttt tatcctttta	10680
ggttgcctat aaagggggtc cccatcgaat tacaagtgga atgcttcaca tgggacaaaa	10740
aactctggtg ccgtcacttc tgtgtgcttg cggactcaga atctggtgga catatcactc	10800
actctgggat ggtgggcatg ggagtcagct gcacagtcac ccgggaagat ggaaccaatc	10860
gcagataggg ctgctagtga accaatcaca tgatgtcacc cagacatcag gcataccac	10920
tagtctaccc tccatcattg ttataaaaaa cttaggaacc aggtccacac agccgccagc	10980
ccatcaacgc gtacgatggc atcacaggag ggaccactgc ccgaaattga ggacgaagtg	11040
tttagaaagc gaaatctgac tattatggac ctgcaccccg gatctggcaa gaccggaga	11100
tacctgccag ccatcgtgag ggaggctatt aagcggaac tgagaacact gatcctggcc	11160
ccaactcgcg tggtcgcttc cgaaatggct gaggccctga aaggcatgcc catccggtat	11220
cagaccacag cagtgaagtc tgaacatacc ggcaaggaga ttgtggacct gatgtgccac	11280
gccactttca ccatgcgact gctgagccca gtgcgggtcc ccaactacaa tatgatcatt	11340

atggacgagg	cccactttac	tgatcccagc	tccatcgccg	ctagaggata	tattttccacc	11400
aggggtgggaa	tgggcgaggc	agcagctatc	ttcatgacag	caactccccc	tggcagcgtg	11460
gaggcatttc	ctcagtccaa	cgccgtcatc	caggacgagg	agcgggacat	tcctgagcgg	11520
agctggaatt	ctgggtacga	atggatcaca	gacgaggatc	atgcacactg	gactgaagcc	11580
aagatgctgc	tggacaacat	taatactcct	gagggaatca	ttccagctct	gttcgagccc	11640
gaaagagaga	agtctgcagc	catcgacggc	gagtatagac	tgaggggaga	ggcccggaag	11700
accttcgtgg	aactgatgag	gcgcgggcat	ctgcccgtgt	ggctgagtta	caaggtcgct	11760
tcagagggat	tccagtatag	tgaccgacgg	tggtgctttg	atggcgaacg	caacaatcag	11820
gtgctggagg	agaacatgga	tgtcgagatt	tggacaaagg	aaggcgagcg	gaagaaactg	11880
cgcccacgat	ggctggacgc	tcggacttac	agcgatcccc	tggcactgag	agaattcaaa	11940
gagtttgctg	caggggtggc	cgtcgagaat	caccatcacg	ccgctatgct	ggacgtggat	12000
ctgcatcctg	ccagtgcttg	gaccctgtat	gcagtggcca	ctaccatcat	taccccaatg	12060
atgcgccaca	caatcgagaa	cacaactgcc	aatatctcac	tgacagctat	tgcaaaccag	12120
gcagccattc	tgatgggact	ggacaaaggc	tggcccatca	gcaagatgga	tattggcgtg	12180
cctctgctgg	ccctgggggtg	ttacagtcag	gtgctggaca	tcattggcca	gaggatcgag	12240
aacattaagc	atgagcacia	atcaacctgg	cattacgacg	aagataatcc	ctataagaca	12300
tgggcctacc	acggaagcta	tgaggtgaaa	ccttcaggca	gcgccagcag	catggtcaac	12360
gggggtggta	agctgctgac	caaaccttgg	gacgtgatcc	caatggtcac	tcagattgcc	12420
atgaccgata	ccaccccatt	cggccagcag	cgggtgttca	aggagaaggt	ggacacccgc	12480
acacctaagg	ctaaacgagg	gactgcacag	atcatggagg	tgaccgcaa	gtggctgtgg	12540
ggattcctgt	ccaggaacaa	gaagccaaga	atctgtacca	gggaagagtt	cacaagaaag	12600
gtccggtcaa	acgcctaatt	agcgcgcagc	gcttagacgt	ctcgcgatcg	atgctagtgt	12660
gaaatagaca	tcagaattaa	gaaaaacgta	gggtccaagt	ggttccccgt	tatggactcg	12720
ctatctgtca	accagatctt	ataccctgaa	gttcacctag	atagcccgat	agttaccaat	12780
aagatagtag	ccatcctgga	gtatgctcga	gtccctcacg	cttacagcct	ggaggaccct	12840
acactgtgtc	agaacatcaa	gcaccgccta	aaaaacggat	tttccaacca	aatgattata	12900
aacaatgtgg	aagttgggaa	tgtcatcaag	tccaagctta	ggagttatcc	ggcccactct	12960

catattccat atccaaattg taatcaggat ttattttaaca tagaagacaa agagtcaacg	13020
aggaagatcc gtgaactcct caaaaagggg aattcgctgt actccaaagt cagtataag	13080
gttttccaat gcttaaggga cactaactca cggcttggcc taggctccga attgaggag	13140
gacatcaagg agaaagttat taacttggga gtttacatgc acagctcca gtggtttgag	13200
ccctttctgt tttggtttac agtcaagact gagatgaggt cagtattaa atcacaaacc	13260
catacttgcc ataggaggag acacacacct gtattcttca ctggtagttc agttgagttg	13320
ctaactcttc gtgaccttgt tgctataatc agtaaagagt ctcaacatgt atattacctg	13380
acatttgaac tggttttgat gtatttgtat gtcatagagg ggaggttaat gacagagacc	13440
gctatgacta ttgatgctag gtatacagag cttctaggaa gagtacagata catgtggaaa	13500
ctgatagatg gtttcttccc tgcactcggg aatccaactt atcaaattgt agccatgctg	13560
gagcctcttt cacttgctta cctgcagctg aggatataa cagtagaact cagagggtgt	13620
ttccttaacc actgctttac tgaaatacat gatgttcttg accaaaacgg gttttctgat	13680
gaaggactt atcatgagtt aactgaagct ctagattaca ttttcataac tgatgacata	13740
catctgacag gggagatttt ctcatTTTTc agaagtttcg gccaccccag acttgaagca	13800
gtaacggctg ctgaaaatgt taggaaatac atgaatcagc ctaaagtcac tgtgtatgag	13860
actctgatga aaggctcatgc catattttgt ggaatcataa tcaacggcta tcgtgacagg	13920
cacggaggca gttggccacc gctgaccctc cccctgcatg ctgcagacac aatccggaat	13980
gctcaagctt cagggtgaagg gttacacat gagcagtgcg ttgataactg gaaatctttt	14040
gctggagtga aatttggctg ctttatgcct cttagcctgg atagtgatct gacaatgtac	14100
ctaaaggaca aggcaattgc tgctctcaa agggaatggg attcagttta cccgaaagag	14160
ttcctgcgtt acgaccctcc caagggaacc gggtcacgga ggcttgtaga tgttttcctt	14220
aatgattcga gctttgacct atatgatgtg ataatgtatg ttgtaagtgg agcttacctc	14280
catgaccctg agttcaacct gtcttacagc ctgaaagaaa aggagatcaa ggaaacaggt	14340
agactttttg ctaaaatgac ttacaaaatg agggcatgcc aagtgattgc tgaaaatcta	14400
atctcaaacg ggattggcaa atattttaag gacaatggga tggccaagga tgagcacgat	14460
ttgactaagg cactccacac tctagctgtc tcaggagtcc ccaaagatct caaagaaagt	14520
cacagggggg ggccagtctt aaaaacctac tcccgaagcc cagtccacac aagtaccagg	14580

aacgtgagag	cagcaaaagg	gtttataggg	ttccctcaag	taattcggca	ggaccaagac	14640
actgatcatc	cggagaatat	ggaagcttac	gagacagtca	gtgcatttat	cacgactgat	14700
ctcaagaagt	actgccttaa	ttggagatat	gagaccatca	gcttgtttgc	acagaggcta	14760
aatgagattt	acggattgcc	ctcatttttc	cagtggctgc	ataagaggct	tgagacctct	14820
gtcctgtatg	taagtgacct	tcattgcccc	cccgaccttg	acgcccata	cccgttatat	14880
aaagtcccca	atgatcaaat	cttcattaag	taccctatgg	gaggtataga	agggtattgt	14940
cagaagctgt	ggaccatcag	caccattccc	tatctatacc	tggctgctta	tgagagcgga	15000
gtaaggattg	cttcgttagt	gcaaggggac	aatcagacca	tagccgtaac	aaaaagggta	15060
cccagcacat	ggccctacaa	ccttaagaaa	cgggaagctg	ctagagtaac	tagagattac	15120
tttgtaattc	ttaggcaaag	gctacatgat	attggccatc	acctcaaggc	aaatgagaca	15180
attgtttcat	cacatttttt	tgtctattca	aaaggaatat	attatgatgg	gctacttgtg	15240
tccaatcac	tcaagagcat	cgcaagatgt	gtattctggg	cagagactat	agttgatgaa	15300
acaagggcag	catgcagtaa	tattgctaca	acaatggcta	aaagcatcga	gagaggttat	15360
gaccgttacc	ttgcatattc	cctgaacgtc	ctaaaagtga	tacagcaa	tctgatctct	15420
cttggcttca	caatcaattc	aacctgacc	cgggatgtag	tcatacccct	cctcacaac	15480
aacgacctct	taataaggat	ggcactgttg	cccgtccta	ttggggggat	gaattatctg	15540
aatatgagca	ggctgtttgt	cagaaacatc	ggtgatccag	taacatcatc	aattgctgat	15600
ctcaagagaa	tgattctcgc	ctcactaatg	cctgaagaga	ccctccatca	agtaatgaca	15660
caacaaccgg	gggactcttc	attcctagac	tgggctagcg	acccttactc	agcaa	15720
gtatgtgtcc	agagcatcac	tagactcctc	aagaacataa	ctgcaagggt	tgtcctgatc	15780
catagtccaa	acccaatggt	aaaaggatta	ttccatgatg	acagtaaaga	agaggacgag	15840
ggactggcgg	cattcctcat	ggacaggcat	attatagtac	ctagggcagc	tcatgaaatc	15900
ctggatcata	gtgtcacagg	ggcaagagag	tctattgcag	gcatgctgga	taccacaaaa	15960
ggcttgattc	gagccagcat	gaggaagggg	gggttaacct	ctcgagtgat	aaccagattg	16020
tccaattatg	actatgaaca	attcagagca	gggatgggtgc	tattgacagg	aagaaagaga	16080
aatgtcctca	ttgacaaaga	gtcatgttca	gtgcagctgg	cgagagctct	aagaagccat	16140
atgtgggcga	ggctagctcg	aggacggcct	atttacggcc	ttgaggtccc	tgatgtacta	16200

gaatctatgc gaggccacct tattcggcgt catgagacat gtgtcatctg cgagtgtgga	16260
tcagtcaact acggatgggt ttttgtcccc tcgggttgcc aactggatga tattgacaag	16320
gaaacatcat cttgagagt cccatatatt ggttctacca ctgatgagag aacagacatg	16380
aagcttgcct tcgtaagagc cccaagtcga tccttgcgat ctgctgttag aatagcaaca	16440
gtgtactcat gggcttacgg tgatgatgat agctcttgga acgaagcctg gttgttggt	16500
aggcaaaggg ccaatgtgag cctggaggag ctaagggtga tcactcccat ctcaacttcg	16560
actaatttag cgcatagggt gagggatcgt agcactcaag tgaaatactc aggtacatcc	16620
cttgtccgag tggcgaggta taccacaatc tccaacgaca atctctcatt tgtcatatca	16680
gataagaagg ttgatactaa ctttatatac caacaaggaa tgcttctagg gttgggtgtt	16740
ttagaaacat tgtttcgact cgagaaagat accggatcat ctaacacggt attacatctt	16800
cacgtcgaac cagattgttg cgtgatcccg atgatagatc atcccaggat acccagctcc	16860
cgcaagctag agctgagggc agagctatgt accaaccat tgatatatga taatgcacct	16920
ttaattgaca gagatgcaac aaggctatac acccagagcc ataggaggca ctttgtggaa	16980
tttgttacat ggtccacacc ccaactatat cacatttttag ctaagtccac agcactatct	17040
atgattgacc tggtaacaaa atttgagaag gaccatatga atgaaatttc agctctcata	17100
ggggatgacg atatcaatag tttcataact gagtttctgc tcatagagcc aagattattc	17160
actatctact tgggccagtg tgcggccatc aattgggcat ttgatgtaca ttatcataga	17220
ccatcaggga aatatcagat gggtgagctg ttgtcatcgt tcctttctag aatgagcaaa	17280
ggagtgttta aggtgcttgt caatgctcta agccaccaa agatctacaa gaaattctgg	17340
catttgtgta ttatagagcc tatccatggt ctttcacttg atgctcaaaa cttgcacaca	17400
actgtgtgca acatggttta cacatgctat atgacctacc tcgacctgtt gttgaatgaa	17460
gagttagaag agttcacatt tctcttgtgt gaaagcgacg aggatgtagt accggacaga	17520
ttcgacaaca tccaggcaaa acacttatgt gttctggcag atttgtactg tcaaccaggg	17580
acctgcccac caattcgagg tctaagaccg gtagagaaat gtgcagttct aaccgacat	17640
atcaaggcag aggctatgtt atctccagca ggatcttcgt ggaacataaa tccaattatt	17700
gtagaccatt actcatgctc tctgacttat ctccggcgag gatcgatcaa acagataaga	17760
ttgagagttg atccaggatt cattttcgac gccctcgctg aggtaaatgt cagtcagcca	17820

aagatcggca	gcaacaacat	ctcaaatatg	agcatcaagg	ctttcagacc	cccacacgat	17880
gatgttgcaa	aattgctcaa	agatatcaac	acaagcaagc	acaatcttcc	cattttcaggg	17940
ggcaatctcg	ccaattatga	aatccatgct	ttccgcagaa	tcggggttgaa	ctcatctgct	18000
tgctacaaaag	ctgttgagat	atcaacatta	attaggagat	gccttgagcc	aggggaggac	18060
ggcttgttct	tgggtgaggg	atcgggttct	atgttgatca	cttataaaga	gataacttaaa	18120
ctaaacaagt	gcttctataa	tagtgggggt	tccgccaaatt	ctagatctgg	tcaaagggaa	18180
ttagcaccct	atccctccga	agttggcctt	gtcgaacaca	gaatgggagt	aggtaatatt	18240
gtcaaagtgc	tctttaacgg	gaggcccgaa	gtcacgtggg	taggcagtgt	agattgcttc	18300
aatttcatag	ttagtaatat	ccctacctct	agtgtgggggt	ttatccattc	agatatagag	18360
accttgccctg	acaaagatac	tatagagaag	ctagaggaat	tggcagccat	cttatcgatg	18420
gctctgctcc	tgggcaaaaat	aggatcaata	ctgggtgatta	agcttatgcc	tttcagcggg	18480
gattttgttc	agggatttat	aagttatgta	gggtctcatt	atagagaagt	gaaccttgta	18540
taccctagat	acagcaactt	catctctact	gaatcttatt	tggttatgac	agatctcaag	18600
gctaaccggc	taatgaatcc	tgaaaagatt	aagcagcaga	taattgaatc	atctgtgagg	18660
acttcacctg	gacttatagg	tcacatccta	tccattaagc	aactaagctg	catacaagca	18720
attgtgggag	acgcagttag	tagaggtgat	atcaatccta	ctctgaaaaa	acttacacct	18780
atagagcagg	tgctgatcaa	ttgcggggtt	gcaattaacg	gacctaaagct	gtgcaaagaa	18840
ttgatccacc	atgatgttgc	ctcaggggcaa	gatggattgc	ttaattctat	actcatcctc	18900
tacaggggagt	tggcaagatt	caaagacaac	caaagaagtc	aacaagggat	gttccacgct	18960
taccccgtat	tggtaagtag	caggcaacga	gaacttatat	ctaggatcac	ccgcaaattc	19020
tgggggcaca	ttcttcttta	ctccgggaac	aaaaagttga	taaataagtt	tatccagaat	19080
ctcaagtccg	gctatctgat	actagactta	caccagaata	tcttcgttaa	gaatctatcc	19140
aagtcagaga	aacagattat	tatgacgggg	ggtttgaaac	gtgagtgggt	ttttaaggta	19200
acagtcaagg	agaccaaaga	atggtataag	ttagtcggat	acagtgccct	gattaaggac	19260
taattgggtg	aactccggaa	ccctaatacct	gccctaggtg	gttaggcatt	atttgcaata	19320
tattaaagaa	aactttgaaa	atacgaagtt	tctattccca	gctttgtctg	gtggccggca	19380
tgggtcccagc	ctcctcgctg	gcgccggctg	ggcaacattc	cgaggggacc	gtcccctcgg	19440

taatggcgaa tgggacgcgg ccgatccggc tgctaacaaa gcccgaaagg aagctgagtt	19500
ggctgctgcc accgctgagc aataactagc ataaccctt ggggcctcta aacgggtctt	19560
gaggggtttt ttgctgaaag gaggaactat atccggatgc ggccgcgggc cctatggtac	19620
ccagcttttg ttccctttag tgagggttaa ttccgagctt ggcgtaatca tggtcatagc	19680
tgtttcctgt gtgaaattgt tatccgctca caattccaca caacatagga gccggaagca	19740
taaagtgtaa agcctgggggt gcctaataag tgaggtaact cacattaatt gcgttgcgct	19800
cactgcccgc tttccagtcg ggaaacctgt cgtgccagct gcattaatga atcggccaac	19860
gcgcggggag aggcgggttg cgtattgggc gctcttcgc ttctcgtc actgactcgc	19920
tgcgctcggg cgttcggctg cggcgagcgg tatcagctca ctcaaaggcg gtaatacggg	19980
tatccacaga atcaggggat aacgcaggaa agaacatgtg agcaaaaggc cagcaaaagg	20040
ccaggaaccg taaaaaggcc gcgttgctgg cgtttttcca taggctcggc cccctgacg	20100
agcatcacia aaatcgacgc tcaagtcaga ggtggcgaaa cccgacagga ctataaagat	20160
accaggcggt cccccctgga agctccctcg tgcgctctcc tgttccgacc ctgccgtta	20220
ccggatacct gtccgccttt ctcccttcgg gaagcgtggc gctttctcaa tgctcacgct	20280
gtaggtatct cagttcgggt taggtcggtt gctccaagct gggctgtgtg cacgaacccc	20340
ccgttcagcc cgaccgctgc gccttatccg gtaactatcg tcttgagtcc aaccggtaa	20400
gacacgactt atcgccactg gcagcagcca ctggtaacag gattagcaga gcgaggatat	20460
taggcgggtg tacagagttc ttgaagtggg ggcctaacta cggctacact agaaggacag	20520
tatttggtat ctgcgctctg ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt	20580
gatccggcaa acaaaccacc gctggtagcg gtggtttttt tgtttgcaag cagcagatta	20640
cgcgcagaaa aaaaggatct caagaagatc ctttgatctt ttctacgggg tctgacgctc	20700
agtggaacga aaactcacgt taagggattt tggatcatgag attatcaaaa aggatcttca	20760
cctagatcct tttaaattaa aaatgaagtt ttaaatcaat ctaaagtata tatgagtaaa	20820
cttggtctga cagttaccaa tgcttaatca gtgaggcacc tatctcagcg atctgtctat	20880
ttcgttcatc catagttgcc tgactgcccg tcgtgtagat aactacgata cgggagggct	20940
taccatctgg cccagtgct gcaatgatac cgcgagaccc acgctcaccg gctccagatt	21000
tatcagcaat aaaccagcca gccggaaggg ccgagcgcag aagtggctct gcaactttat	21060

ccgcctccat ccagtctatt aattgttgcc gggaagctag agtaagtagt tcgccagtta	21120
atagtttgcg caacgttggt gccattgcta caggcatcgt ggtgtcacgc tcgtcgtttg	21180
gtatggcttc attcagctcc ggttcccaac gatcaaggcg agttacatga tcccccatgt	21240
tgtgaaaaaa agcggtagc tccttcggtc ctccgatcgt tgtcagaagt aagttggccg	21300
cagtgttatc actcatgctt atggcagcac tgcataattc tcttactgtc atgccatccg	21360
taagatgctt ttctgtgact ggtgagtact caaccaagtc attctgagaa tagtgtatgc	21420
ggcgaccgag ttgctcttgc ccggcgtcaa tacgggataa taccgcgcca catagcagaa	21480
ctttaaaagt gctcatcatt ggaaaacgtt cttcggggcg aaaactctca aggatcttac	21540
cgctgttgag atccagttcg atgtaacca ctctgtcacc caactgatct tcagcatctt	21600
ttactttcac cagcgtttct gggtgagcaa aaacaggaag gcaaaatgcc gcaaaaaagg	21660
gaataagggc gacacggaaa tgttgaatac tcatactctt cttttttcaa tattattgaa	21720
gcatttatca gggttattgt ctcatgagcg gatacatatt tgaatgtatt tagaaaaata	21780
aacaaatagg ggttccgcgc acatttcccc gaaaagtgcc acctgaaatt gtaaacgtta	21840
atattttgtt aaaattcgcg tttaaattttt gttaaatacag ctcatTTTTT aaccaatagg	21900
ccgaaatcgg caaaatccct tataaatcaa aagaatagac cgagataggg ttgagtgttg	21960
ttccagtttg gaacaagagt ccactattaa agaacgtgga ctccaacgtc aaagggcgaa	22020
aaaccgtcta tcaggcgcat ggcccactac gtgaaccatc accctaataca agtttttttg	22080
ggtcgagggtg ccgtaaagca ctaaatcgga accctaaagg gagccccga tttagagctt	22140
gacggggaaa gccggcgaac gtggcgagaa aggaaggga gaaagcgaaa ggagcgggcg	22200
ctagggcgct ggcaagtgt gcggtcacgc tgcgcgtaac caccacacc gccgcgtta	22260
atgcgccgct acagggcgcg tcccattcgc cattcaggct gcgcaactgt tgggaagggc	22320
gatcggtgcg ggcctcttcg ctattacgcc agccaccgcg gtg	22363

<210> 140

<211> 20701

<212> DNA

<213> Artificial Sequence

<220>

<223> Complete optimised nucleotide sequence of the polynucleotide encoding pTM-MVDVax7

<220>
 <221> misc_feature
 <222> (1)..(8)
 <223> NotI

<220>
 <221> misc_feature
 <222> (9)..(28)
 <223> T7 promoter

<220>
 <221> misc_feature
 <222> (29)..(82)
 <223> Hammerhead ribozyme

<220>
 <221> misc_feature
 <222> (83)..(189)
 <223> MV Leader and N promoter

<220>
 <221> misc_feature
 <222> (190)..(1767)
 <223> MV N ORF

<220>
 <221> misc_feature
 <222> (1768)..(1888)
 <223> MV N-P intergenic

<220>
 <221> misc_feature
 <222> (1889)..(3412)
 <223> MV P ORF

<220>
 <221> misc_feature
 <222> (3413)..(3531)
 <223> MV ATU2

<220>
 <221> misc_feature
 <222> (3532)..(5154)
 <223> DENV1 NS polyepitope

<220>
 <221> misc_feature
 <222> (5155)..(5253)
 <223> MV P-M intergenic

<220>
 <221> misc_feature
 <222> (5254)..(6261)

<223> MV M ORF

<220>

<221> misc_feature

<222> (6262)..(7264)

<223> MV M-F intergenic

<220>

<221> misc_feature

<222> (7265)..(8926)

<223> MV F ORF

<220>

<221> misc_feature

<222> (8927)..(9086)

<223> MV-F-H intergenic

<220>

<221> misc_feature

<222> (9087)..(10940)

<223> MV H ORF

<220>

<221> misc_feature

<222> (10941)..(11049)

<223> MV H-L intergenic

<220>

<221> misc_feature

<222> (11050)..(17601)

<223> MV L ORF

<220>

<221> misc_feature

<222> (17602)..(17710)

<223> MV Trailer

<220>

<221> misc_feature

<222> (17711)..(17794)

<223> HDV ribozyme

<220>

<221> misc_feature

<222> (17795)..(17936)

<223> T7 terminator

<220>

<221> misc_feature

<222> (17937)..(17944)

<223> Not I

<220>

<221> misc_feature

<222> (17945)..(20701)

<223> pTM plasmid

<400> 140

gcggccgcta atacgactca ctatagggcc aactttgttt ggtctgatga gtccgtgagg	60
acgaaacccg gagtcccggg tcaccaaaca aagttgggta aggatagttc aatcaatgat	120
catcttctag tgcacttagg attcaagatc ctattatcag ggacaagagc aggattaggg	180
atatccgaga tggccacact ttttaaggagc ttagcattgt tcaaaagaaa caaggacaaa	240
ccaccatta catcaggatc cgggtggagcc atcagaggaa tcaaacacat tattatagta	300
ccaatccctg gagattcctc aattaccact cgatccagac ttctggaccg gttggtgagg	360
ttaattggaa acccggtatgt gagcggggccc aaactaacag gggcactaat aggtatatta	420
tccttatttg tggagtctcc aggtcaattg attcagagga tcaccgatga ccctgacgtt	480
agcataaggc tgtagaggt tgtccagagt gaccagtcac aatctggcct taccttcgca	540
tcaagaggta ccaacatgga ggatgaggcg gaccaatact ttccacatga tgatccaatt	600
agtagtgatc aatccagggt cggatgggtt gggaacaagg aaatctcaga tattgaagtg	660
caagaccctg agggattcaa catgattctg ggtaccatcc tagcccaaatt ttgggtcttg	720
ctcgcaaagg cggttacggc cccagacacg gcagctgatt cggagctaag aaggtggata	780
aagtacaccc aacaaagaag ggtagttggt gaatttagat tggagagaaa atggttggat	840
gtggtgagga acaggattgc cgaggacctc tccttacgcc gattcatggt cgctctaata	900
ctggatatca agagaacacc cggaaacaaa cccaggattg ctgaaatgat atgtgacatt	960
gatacatata tcgtagaggc aggattagcc agttttatcc tgactattaa gtttgggata	1020
gaaactatgt atcctgctct tggactgcat gaatttgctg gtgagttatc cacacttgag	1080
tccttgatga acctttacca gcaaattggg gaaactgcac cctacatggt aatcctggag	1140
aactcaattc agaacaagtt cagtgcagga tcataccctc tgctctggag ctatgccatg	1200
ggagtaggag tggaacttga aaactccatg ggaggtttga actttggccg atcttacttt	1260
gatccagcat attttagatt agggcaagag atggtaagga ggtcagctgg aaaggtcagt	1320
tccacattgg catctgaact cggtatcact gccaggatg caaggcttgt ttcagagatt	1380
gcaatgcata ctactgagga caagatcagt agagcggttg gaccagaca agcccaagta	1440
tcatttctac acggtgatca aagtgagaat gagctaccga gattgggggg caaggaagat	1500

aggaggggtca aacagagtcg aggagaagcc agggagagct acagagaaac cgggcccagc	1560
agagcaagtg atgcgagagc tgcccatctt ccaaccggca caccctaga cattgacact	1620
gcaacggagt ccagccaaga tccgcaggac agtcgaaggt cagctgacgc cctgcttagg	1680
ctgcaagcca tggcaggaat ctcggaagaa caaggctcag acacggacac ccctatagt	1740
tacaatgaca gaaatcttct agactaggtg cgagaggccg agggccagaa caacatccgc	1800
ctaccatcca tcattgttat aaaaaactta ggaaccaggt ccacacagcc gccagcccat	1860
caaccatcca ctcccacgat tggagccaat ggcagaagag caggcacgcc atgtcaaaaa	1920
cggactggaa tgcattccggg ctctcaaggc cgagcccatc ggctcactgg ccatcgagga	1980
agctatggca gcatggctcag aaatatcaga caaccagga caggagcgag ccacctgcag	2040
ggaagagaag gcaggcagtt cgggtctcag caaacatgc ctctcagcaa ttggatcaac	2100
tgaaggcggg gcacctcgca tccgcgggtca gggacctgga gagagcgatg acgacgctga	2160
aactttggga atcccccaa gaaatctcca ggcattcaagc actgggttac agtgttatta	2220
cgtttatgat cacagcgggtg aagcgggtta gggaaatcaa gatgctgact ctatcatggt	2280
tcaatcaggc cttgatgggtg atagcaccct ctcaggagga gacaatgaat ctgaaaacag	2340
cgatgtggat attggcgaac ctgataccga gggatatgct atcactgacc ggggatctgc	2400
tcccatctct atgggggttca gggcttctga tgttgaaact gcagaaggag gggagatcca	2460
cgagctcctg agactccaat ccagaggcaa caactttccg aagcttggga aaactctcaa	2520
tgttcctccg ccccgacc ccggtagggc cagcacttcc gggacacca ttaaaaagg	2580
cacagacgcg agattagcct catttggaac ggagatcgcg tctttattga caggtggtgc	2640
aaccaatgt gctcgaaagt caccctcgga accatcaggg ccaggtgcac ctgcggggaa	2700
tgtccccgag tgtgtgagca atgccgcact gatacaggag tggacacccg aatctggtac	2760
cacaatctcc ccgagatccc agaataatga agaaggggga gactattatg atgatgagct	2820
gttctctgat gtccaagata ttaaaacagc cttggccaaa atacacgagg ataatcagaa	2880
gataatctcc aagctagaat cactgctgtt attgaaggga gaagttgagt caattaagaa	2940
gcagatcaac aggcaaaata tcagcatatc caccctggaa ggacacctct caagcatcat	3000
gatcgccatt cctggacttg ggaaggatcc caacgacccc actgcagatg tcgaaatcaa	3060
tcccgacttg aaacccatca taggcagaga ttcaggccga gcactggccg aagtttctcaa	3120

gaaacccgtt gccagccgac aactccaagg aatgacaaat ggacggacca gttccagagg	3180
acagctgctg aaggaatttc agctaaagcc gatcgggaaa aagatgagct cagccgtcgg	3240
gtttgttcct gacaccggcc ctgcatcacg cagtgtaatc cgctccatta taaaatccag	3300
ccggctagag gaggatcgga agcgttacct gatgactctc cttgatgata tcaaaggagc	3360
caatgatctt gccaaattcc accagatgct gatgaagata ataatgaagt agctacagct	3420
caacttacct gccaacccca tgccagtcga cccaactagc ctaccctcca tcattgttat	3480
aaaaaactta ggaaccaggt ccacacagcc gccagcccat caacgcgtac gatggcatca	3540
caggagggac cactgcccga aattgaggac gaagtgttta gaaagcgaaa tctgactatt	3600
atggacctgc accccggatc tggcaagacc cggagatacc tgccagccat cgtgaggagg	3660
gctattaagc ggaaactgag aacactgatc ctggcccca ctcgcgtggt cgcttccgaa	3720
atggctgagg ccctgaaagg catgcccata cggtatcaga ccacagcagt gaagtctgaa	3780
cataccggca aggagattgt ggacctgatg tgccacgcca ctttcacat gcgactgctg	3840
agcccagtgc ggggtcccaa ctacaatatg atcattatgg acgaggccca ctttactgat	3900
cccagctcca tcgccgctag aggatatatt tccaccaggg tgggaatggg cgaggcagca	3960
gctatcttca tgacagcaac tccccctggc agcgtggagg catttcctca gtccaacgcc	4020
gtcatccagg acgaggagcg ggacattcct gagcggagct ggaattcttg gtacgaatgg	4080
atcacagacg aggatcatgc aactggact gaagccaaga tgctgctgga caacattaat	4140
actcctgagg gaatcattcc agctctgttc gagcccgaaa gagagaagtc tgcagccatc	4200
gacggcgagt atagactgag gggagaggcc cggaagacct tcgtggaact gatgaggcgc	4260
ggcgatctgc ccgtgtggct gagttacaag gtcgcttcag agggattcca gtatagtac	4320
cgacggtggt gctttgatgg cgaacgcaac aatcaggtgc tggaggagaa catggatgtc	4380
gagatttga caaaggaagg cgagcggaag aaactgcgcc cacgatggct ggacgctcgg	4440
acttacagcg atccccctggc actgagagaa ttcaaagagt ttgctgcagg ggtggccgtc	4500
gagaatcacc atcacgccg tatgctggac gtggatctgc atcctgccag tgcttgacc	4560
ctgtatgcag tggccactac catcattacc ccaatgatgc gccacacaat cgagaacaca	4620
actgccaata tctcactgac agctattgca aaccaggcag ccattctgat gggactggac	4680
aaaggctggc ccatcagcaa gatggatatt ggcgtgcctc tgctggccct ggggtgttac	4740

agtcaggtgc tggacatcat tggccagagg atcgagaaca ttaagcatga gcacaaatca	4800
acctggcatt acgacgaaga taatccctat aagacatggg cctaccacgg aagctatgag	4860
gtgaaacctt caggcagcgc cagcagcatg gtcaacgggg tgggtcaagct gctgaccaa	4920
ccttgggacg tgatcccaat ggtcactcag attgccatga ccgataccac cccattcggc	4980
cagcagcggg tgttcaagga gaaggtggac acccgcacac ctaaggctaa acgagggact	5040
gcacagatca tggaggtgac cgccaagtgg ctgtggggat tcctgtccag gaacaagaag	5100
ccaagaatct gtaccagga agagttcaca agaaaggtcc ggtcaaacgc ctaatgagcg	5160
cgcagcgctt agacgtctcg cgatcgatac tagtacaacc taaatccatt ataaaaaact	5220
taggagcaaa gtgattgcct cccaaggtcc acaatgacag agacctacga cttcgacaag	5280
tcggcatggg acatcaaagg gtcgatcgct ccgatacaac ccaccaccta cagtgatggc	5340
aggctgggtgc cccaggtcag agtcatagat cctgggtctag gcgacaggaa ggatgaatgc	5400
tttatgtaca tgtttctgct ggggggttgtt gaggacagcg attccctagg gcctccaatc	5460
gggcgagcat ttgggttcct gcccttaggt gttggcagat ccacagcaaa gcccgaaaaa	5520
ctcctcaaag aggccactga gcttgacata gttgttagac gtacagcagg gctcaatgaa	5580
aaactgggtg tctacaacaa caccacctta actctctca caccttgag aaaggtccta	5640
acaacaggga gtgtcttcaa cgcaaacc aa gtgtgcaatg cggttaatct gataccgctc	5700
gataccccgc agaggttccg tgttgtttat atgagcatca cccgtctttc ggataacggg	5760
tattacaccg ttcctagaag aatgctggaa ttcagatcgg tcaatgcagt ggccttcaac	5820
ctgctgggtga cccttaggat tgacaaggcg ataggccctg ggaagatcat cgacaataca	5880
gagcaacttc ctgaggcaac atttatggtc cacatcggga acttcaggag aaagaagagt	5940
gaagtctact ctgccgatta ttgcaaaatg aaaatcgaaa agatgggcct ggtttttgca	6000
cttgggtggga tagggggcac cagtcttcac attagaagca caggcaaaat gagcaagact	6060
ctccatgcac aactcgggtt caagaagacc ttatgttacc cgctgatgga tatcaatgaa	6120
gaccttaatc gattactctg gaggagcaga tgcaagatag taagaatcca ggcagttttg	6180
cagccatcag ttcctcaaga attccgcatt tacgacgacg tgatcataaa tgatgaccaa	6240
ggactattca aagttctgta gaccgtagtg cccagcaatg cccgaaaacg acccccctca	6300
caatgacagc cagaaggccc ggacaaaaaa gcccctccg aaagactcca cggaccaagc	6360

gagaggccag ccagcagccg acggcaagcg cgaacaccag gcggccccag cacagaacag	6420
ccctgacaca aggccaccac cagccacccc aatctgcatc ctctctgtgg gacccccgag	6480
gaccaacccc caaggctgcc cccgatccaa accaccaacc gcatccccac cacccccggg	6540
aaagaaaccc ccagcaattg gaaggcccct cccctcttc ctcaacacaa gaactccaca	6600
accgaaccgc acaagcgacc gaggtgacct aaccgcaggc atccgactcc ctagacagat	6660
cctctctccc cggcaaacta aaaaaactt agggccaagg aacatacaca cccaacagaa	6720
cccagacccc ggcccacggc gccgcgcccc caacccccga caaccagagg gagccccaa	6780
ccaatcccg cggctcccc ggtgcccaca ggcagggaca ccaacccccg aacagaccca	6840
gcaccaacc atcgacaatc caagacgggg gggccccccc aaaaaaaggc ccccaggggc	6900
cgacagccag caccgcgagg aagcccaccc accccacaca cgaccacggc aaccaaacca	6960
gaaccagac caccctgggc caccagctcc cagactcggc catcaccgag cagaaaggaa	7020
aggccacaac ccgcgaccc cagccccgat ccggcgggga gccaccaac ccgaaccagc	7080
accaagagc gatccccgaa ggacccccga accgcaaagg acatcagtat cccacagcct	7140
ctccaagtcc cccggtctcc tcctcttctc gaagggacca aaagatcaat ccaccacacc	7200
cgacgacact caactcccca cccctaaagg agacaccggg aatcccagaa tcaagactca	7260
tccaatgtcc atcatgggtc tcaaggtgaa cgtctctgcc atattcatgg cagtactgtt	7320
aactctccaa acaccaccg gtcaaattca ttggggcaat ctctctaaga taggggtggt	7380
aggaatagga agtgcaagct acaaagttat gactcgttcc agccatcaat cattagtcac	7440
aaaattaatg cccaatataa ctctcctcaa taactgcacg agggtagaga ttgcagaata	7500
caggagacta ctgagaacag ttttgaacc aattagagat gcacttaatg caatgaccca	7560
gaatataaga ccggttcaga gtgtagcttc aagtaggaga cacaagagat ttgcgggagt	7620
agtcctggca ggtgcggccc taggcgttgc cacagctgct cagataacag ccggcattgc	7680
acttcaccag tccatgctga actctcaagc catcgacaat ctgagagcga gcctggaaac	7740
tactaatcag gcaattgaga caatcagaca agcagggcag gagatgatat tggctgttca	7800
gggtgtccaa gactacatca ataattgagct gataccgtct atgaaccaac tatcttgtga	7860
tttaatcggc cagaagctcg ggctcaaatt gctcagatac tatacagaaa tcctgtcatt	7920
atttgcccc agtttacggg accccatatc tgcggagata tctatccagg ctttgagcta	7980

tgcgcttgga ggagacatca ataaggtggt agaaaagctc ggatacagtg gaggtgattt	8040
actggggcatc ttagagagcg gaggaataaa ggcccggata actcacgtcg acacagagtc	8100
ctacttcatt gtcctcagta tagcctatcc gacgctgtcc gagattaagg ggggtgattgt	8160
ccaccggcta gaggggggtct cgtacaacat aggctctcaa gagtgggtata ccaactgtgcc	8220
caagtatggt gcaacccaag ggtaccttat ctcgaatttt gatgagtcac cgtgtacttt	8280
catgccagag gggactgtgt gcagccaaaa tgccttgtag ccgatgagtc ctctgctcca	8340
agaatgcctc cggggggtaca ccaagtcctg tgctcgtaca ctcgtatccg ggtcttttgg	8400
gaaccggttc attttatcac aagggaacct aatagccaat tgtgcatcaa tcctttgcaa	8460
gtgttacaca acaggaacga tcattaatca agaccctgac aagatcctaa catacattgc	8520
tgccgatcac tgcccggtag tcgaggtgaa cggcgtgacc atccaagtcg ggagcaggag	8580
gtatccagac gctgtgtact tgcacagaat tgacctcggc cctcccatat cattggagag	8640
gttggacgta gggacaaatc tggggaatgc aattgctaag ttggaggatg ccaaggaatt	8700
gttggagtca tcggaccaga tattgaggag tatgaaaggt ttatcgagca ctagcatagt	8760
ctacatcctg attgcagtgt gtcttggagg gttgataggg atccccgctt taatatgttg	8820
ctgcaggggg cgttgtaaca aaaagggaga acaagttggt atgtcaagac caggcctaaa	8880
gcctgatctt acgggaacat caaaatccta tgtaaggtcg ctctgacatc ctacaactct	8940
tgaaacacaa atgtcccaca agtctcctct tcgtcatcaa gcaaccaccg caccagcat	9000
caagcccacc tgaaattatc tccggcttcc ctctggccga acaatatcgg tagttaatca	9060
aaacttaggg tgcaagatca tccacaatgt caccacaacg agaccggata aatgccttct	9120
acaaagataa ccccatccc aagggaagta ggatagtcac taacagagaa catcttatga	9180
ttgatagacc ttatgttttg ctggctgttc tgtttgtcat gtttctgagc ttgatcgggt	9240
tgctagccat tgcaggcatt agacttcac gggcagccat ctacaccgca gagatccata	9300
aaagcctcag caccaatcta gatgtaacta actcaatcga gcatcaggtc aaggacgtgc	9360
tgacaccact cttcaaaatc atcgggtgatg aagtgggcct gaggacacct cagagattca	9420
ctgacctagt gaaattaatc tctgacaaga ttaaattcct taatccggat aggaggtacg	9480
acttcagaga tctcacttgg tgtatcaacc cgccagagag aatcaaattg gattatgatc	9540
aatactgtgc agatgtggct gctgaagagc tcatgaatgc attggtgaac tcaactctac	9600

tggagaccag aacaaccaat cagttcctag ctgtctcaaa gggaaactgc tcagggccca	9660
ctacaatcag aggtcaattc tcaaacatgt cgctgtccct gttagacttg tatttaggtc	9720
gaggttacaa tgtgtcatct atagtcacta tgacatccca gggaatgtat gggggaactt	9780
acctagtgga aaagccta atctgagcagca aaaggtcaga gttgtcacia ctgagcatgt	9840
accgagtgtt tgaagtaggt gttatcagaa atccgggttt gggggctccg gtgttccata	9900
tgacaaacta tcttgagcaa ccagtcagta atgatctcag caactgtatg gtggctttgg	9960
gggagctcaa actcgcagcc ctttgtcacg gggaagattc tatcacaatt ccctatcagg	10020
gatcaggga aggtgtcagc ttccagctcg tcaagctagg tgtctgaaa tcccaaccg	10080
acatgcaatc ctgggtcccc ttatcaacgg atgatccagt gatagacagg ctttacctct	10140
catctcacag aggtgttatc gctgacaatc aagcaaatg ggctgtcccg acaacacgaa	10200
cagatgacaa gttgcgaatg gagacatgct tccaacaggc gtgtaagggt aaaatccaag	10260
cactctgcga gaatcccag tgggcaccat tgaaggataa caggattcct tcatacgggg	10320
tcttgtctgt tgatctgagt ctgacagttg agcttaaaat caaaattgct tcgggattcg	10380
ggccattgat cacacacggt tcagggatgg acctatacaa atccaaccac aacaatgtgt	10440
attggctgac tatcccgcca atgaagaacc tagccttagg tgtaatcaac acattggagt	10500
ggataccgag attcaagggt agtccctacc tcttactgt cccaattaag gaagcaggcg	10560
aagactgcca tgccccaaca tacctacctg cggaggtgga tggatgatgtc aaactcagtt	10620
ccaatctggg gattctacct ggtcaagatc tccaatatgt tttggcaacc tacgatactt	10680
ccagggttga acatgctgtg gtttattacg ttacagccc aagccgctca ttttcttact	10740
tttatccttt taggttgcct ataaaggggg tccccatcga attacaagtg gaatgcttca	10800
catgggacca aaaactctgg tgccgtcact tctgtgtgct tgcggactca gaatctggtg	10860
gacatatcac tcactctggg atggtgggca tgggagtcag ctgcacagtc acccggaag	10920
atggaaccaa tcgcagatag ggctgctagt gaaccaatca catgatgtca ccagacatc	10980
aggcataccc actagtgtga aatagacatc agaattaaga aaaacgtagg gtccaagtgg	11040
ttccccgtta tggactcgct atctgtcaac cagatcttat accctgaagt tcacctagat	11100
agcccgatag ttaccaataa gatagtagcc atcctggagt atgctcgagt ccctcacgct	11160
tacagcctgg aggaccctac actgtgtcag aacatcaagc accgcctaaa aaacggattt	11220

tccaacaaaa	tgattataaa	caatgtggaa	gttgggaaatg	tcatcaagtc	caagcttagg	11280
agttatccgg	cccactctca	tattccatat	ccaaattgta	atcaggattt	atttaacata	11340
gaagacaaa	agtcacgag	gaagatccgt	gaactcctca	aaaaggggaa	ttcgctgtac	11400
tccaaagtca	gtgataaggt	tttccaatgc	ttaagggaca	ctaactcacg	gcttggccta	11460
ggctccgaat	tgaggaggga	catcaaggag	aaagttatta	acttgggagt	ttacatgcac	11520
agctcccagt	ggtttgagcc	ctttctgttt	tggtttacag	tcaagactga	gatgagggtca	11580
gtgattaaat	cacaaacca	tacttgccat	aggaggagac	acacacctgt	attcttcact	11640
ggtagttcag	ttgagttgct	aatctctcgt	gaccttgttg	ctataatcag	taaagagtct	11700
caacatgtat	attacctgac	at ttgaactg	gttttgatgt	attgtgatgt	catagagggg	11760
aggttaatga	cagagaccgc	tatgactatt	gatgctaggt	atacagagct	tctaggaaga	11820
gtcagataca	tgtggaaact	gatagatggg	ttcttccttg	cactcgggaa	tccaacttat	11880
caaattgtag	ccatgctgga	gcctctttca	cttgcttacc	tgacagctgag	ggatataaca	11940
gtagaactca	gaggtgcttt	ccttaaccac	tgctttactg	aaatacatga	tgttcttgac	12000
caaaacgggt	tttctgatga	aggtacttat	catgagttaa	ctgaagctct	agattacatt	12060
ttcataactg	atgacataca	tctgacaggg	gagattttct	catttttcag	aagtttcggc	12120
caccccagac	ttgaagcagt	aacggctgct	gaaaatgtta	ggaaatacat	gaatcagcct	12180
aaagtcattg	tgtatgagac	tctgatgaaa	ggcatgcca	tattttgtgg	aatcataatc	12240
aacggctatc	gtgacaggca	cggaggcagt	tggccaccgc	tgaccctccc	cctgcatgct	12300
gcagacacaa	tccggaatgc	tcaagcttca	ggtgaagggt	taacacatga	gcagtgcgtt	12360
gataactgga	aatcttttgc	tggagtgaaa	tttggctgct	ttatgcctct	tagcctggat	12420
agtgatctga	caatgtacct	aaaggacaag	gcacttgctg	ctctccaaag	ggaatgggat	12480
tcagtttacc	cgaaagagtt	cctgcgttac	gaccctccca	agggaaccgg	gtcacggagg	12540
ctttagatg	ttttccttaa	tgattcgagc	tttgacccat	atgatgtgat	aatgtatgtt	12600
gtaagtggag	cttacctcca	tgaccctgag	ttcaacctgt	cttacagcct	gaaagaaaag	12660
gagatcaagg	aaacaggtag	actttttgct	aaaatgactt	acaaaatgag	ggcatgccaa	12720
gtgattgctg	aaaatcta	ctcaaacggg	attggcaa	attttaagga	caatgggatg	12780
gccaaggatg	agcacgattt	gactaaggca	ctccacactc	tagctgtctc	aggagtcccc	12840

aaagatctca	aagaaagtca	cagggggggg	ccagtcttaa	aaacctactc	ccgaagccca	12900
gtccacacaa	gtaccaggaa	cgtgagagca	gcaaaagggt	ttatagggtt	ccctcaagta	12960
attcggcagg	accaagacac	tgatcatccg	gagaatatgg	aagcttacga	gacagtcagt	13020
gcatttatca	cgactgatct	caagaagtac	tgctttaatt	ggagatatga	gaccatcagc	13080
ttgtttgcac	agaggctaaa	tgagatttac	ggattgccct	cattttttcca	gtggctgcat	13140
aagaggcttg	agacctctgt	cctgtatgta	agtgaccctc	attgcccccc	cgaccttgac	13200
gcccataatcc	cgttatataa	agtccccaat	gatcaaatct	tcattaagta	ccctatggga	13260
ggtatagaag	ggtattgtca	gaagctgtgg	accatcagca	ccattcccta	tctataacctg	13320
gctgcttatg	agagcggagt	aaggattgct	tcgttagtgc	aaggggacaa	tcagaccata	13380
gccgtaacaa	aaaggggtacc	cagcacatgg	ccctacaacc	ttaagaaacg	ggaagctgct	13440
agagtaacta	gagattactt	tgtaattctt	aggcaaaggc	tacatgatat	tggccatcac	13500
ctcaaggcaa	atgagacaat	tgtttcatca	catttttttg	tctattcaaa	aggaatatat	13560
tatgatgggc	tacttgtgtc	ccaatcactc	aagagcatcg	caagatgtgt	attctggtca	13620
gagactatag	ttgatgaaac	aagggcagca	tgacagtaata	ttgctacaac	aatggctaaa	13680
agcatcgaga	gaggttatga	ccgttacctt	gcatattccc	tgaacgtcct	aaaagtgata	13740
cagcaaattc	tgatctctct	tggcttcaca	atcaattcaa	ccatgaccgc	ggatgtagtc	13800
ataccctcc	tcacaaacaa	cgacctctta	ataaggatgg	cactgttgcc	cgctcctatt	13860
gggggggatga	attatctgaa	tatgagcagg	ctgtttgtca	gaaacatcgg	tgatccagta	13920
acatcatcaa	ttgctgatct	caagagaatg	attctcgcct	cactaatgcc	tgaagagacc	13980
ctccatcaag	taatgacaca	acaaccgggg	gactcttcat	tcctagactg	ggctagcgac	14040
ccttactcag	caaatcttgt	atgtgtccag	agcatcacta	gactcctcaa	gaacataact	14100
gcaaggtttg	tcctgatcca	tagtccaaac	ccaatgttaa	aaggattatt	ccatgatgac	14160
agtaaagaag	aggacgaggg	actggcggca	ttcctcatgg	acaggcatat	tatagtacct	14220
agggcagctc	atgaaatcct	ggatcatagt	gtcacagggg	caagagagtc	tattgcaggc	14280
atgctggata	ccacaaaagg	cttgattcga	gccagcatga	ggaagggggg	gttaacctct	14340
cgagtgataa	ccagattgtc	caattatgac	tatgaacaat	tcagagcagg	gatggtgcta	14400
ttgacaggaa	gaaagagaaa	tgtcctcatt	gacaaagagt	catgttcagt	gcagctggcg	14460

agagctctaa gaagccatat gtgggcgagg ctagctcgag gacggcctat ttacggcctt	14520
gagggtccctg atgtactaga atctatgcga ggccacctta ttcggcgtca tgagacatgt	14580
gtcatctgcg agtgtggatc agtcaactac ggatggtttt ttgtcccctc gggttgccaa	14640
ctggatgata ttgacaagga aacatcatcc ttgagagtcc catatatattgg ttctaccact	14700
gatgagagaa cagacatgaa gcttgccttc gtaagagccc caagtcgatc cttgcgatct	14760
gctgttagaa tagcaacagt gtactcatgg gcttacgggtg atgatgatag ctcttggaac	14820
gaagcctgggt tggtggctag gcaaagggcc aatgtgagcc tggaggagct aagggtgatc	14880
actcccatct caacttcgac taatttagcg cataggttga gggatcgtag cactcaagtg	14940
aaatactcag gtacatccct tgtccgagtg gcgagggtata ccacaatctc caacgacaat	15000
ctctcatttg tcatatcaga taagaagggt gatactaact ttatatacca acaaggaatg	15060
cttctagggt tgggtgtttt agaaacattg tttcgactcg agaaagatac cggatcatct	15120
aacacggtat tacatcttca cgtcgaaaca gattgttgcg tgatcccgat gatagatcat	15180
cccaggatac ccagctcccg caagctagag ctgagggcag agctatgtac caaccattg	15240
atatatgata atgcaccttt aattgacaga gatgcaacaa ggctatacac ccagagccat	15300
aggaggcacc ttgtggaatt tgttacatgg tccacacccc aactatatca catttttagct	15360
aagtccacag cactatctat gattgacctg gtaacaaaat ttgagaagga ccatatgaat	15420
gaaatttcag ctctcatagg ggatgacgat atcaatagtt tcataactga gtttctgctc	15480
atagagccaa gattattcac tatctacttg ggccagtgtg cggccatcaa ttgggcattt	15540
gatgtacatt atcatagacc atcagggaaa tatcagatgg gtgagctgtt gtcatcgttc	15600
ctttctagaa tgagcaaagg agtgtttaag gtgcttgtca atgctctaag ccacccaaag	15660
atctacaaga aattctggca ttgtggtatt atagagccta tccatgggtcc ttcacttgat	15720
gctcaaaact tgcacacaac tgtgtgcaac atggttttaca catgctatat gacctacctc	15780
gacctgttgt tgaatgaaga gttagaagag ttcacatttc tcttgtgtga aagcgacgag	15840
gatgtagtac cggacagatt cgacaacatc caggcaaaac acttatgtgt tctggcagat	15900
ttgtactgtc aaccagggtc ctgcccacca attcgagggtc taagaccggt agagaaatgt	15960
gcagttctaa ccgaccatat caaggcagag gctatgttat ctccagcagg atcttcgtgg	16020
aacataaatc caattattgt agaccattac tcatgctctc tgacttatct ccggcgagga	16080

tcgatcaaac agataagatt gagagttgat ccaggattca ttttcgacgc cctcgctgag	16140
gtaaagtgtca gtcagccaaa gatcggcagc aacaacatct caaatatgag catcaaggct	16200
ttcagacccc cacacgatga tgttgcaaaa ttgctcaaag atatcaacac aagcaagcac	16260
aatcttccca tttcaggggg caatctcgcc aattatgaaa tccatgcttt ccgcagaatc	16320
gggttgaact catctgcttg ctacaaagct gttgagatat caacattaat taggagatgc	16380
cttgagccag gggaggacgg cttgttcttg ggtgagggat cgggttctat gttgatcact	16440
tataaagaga tacttaaact aaacaagtgc ttctataata gtggggtttc cgccaattct	16500
agatctggtc aaaggaatt agcaccctat ccctccgaag ttggccttgt cgaacacaga	16560
atgggagtag gtaatatgtt caaagtgtc tttaacggga ggcccgaagt cacgtgggta	16620
ggcagtgtag attgcttcaa tttcatagtt agtaatatcc ctaccttag tgtggggttt	16680
atccattcag atatagagac cttgcctgac aaagatacta tagagaagct agaggaattg	16740
gcagccatct tatcgatggc tctgctcctg ggcaaaatag gatcaatact ggtgattaag	16800
cttatgcctt tcagcgggga ttttgttcag ggatttataa gttatgtagg gtctcattat	16860
agagaagtga accttgata ccctagatac agcaacttca tctctactga atcttatttg	16920
gttatgacag atctcaaggc taaccggcta atgaatcctg aaaagattaa gcagcagata	16980
attgaatcat ctgtgaggac ttcacctgga cttataggtc acatcctatc cattaagcaa	17040
ctaagctgca tacaagcaat tgtgggagac gcagttagta gaggtgatat caatcctact	17100
ctgaaaaaac ttacacctat agagcaggtg ctgatcaatt gcgggttggc aattaacgga	17160
cctaagctgt gcaaagaatt gatccaccat gatgttgctt cagggaaga tggattgctt	17220
aattctatac tcatcctcta caggagttg gcaagattca aagacaacca aagaagtcaa	17280
caagggatgt tccacgctta cccggtattg gtaagtagca ggcaacgaga acttatatct	17340
aggatcacc gcaaattctg ggggcacatt cttctttact ccgggaacaa aaagttgata	17400
aataagtta tccagaatct caagtccggc tatctgatac tagacttaca ccagaatatc	17460
ttcgtaaga atctatcaa gtcagagaaa cagattatta tgacgggggg tttgaaacgt	17520
gagtgggttt ttaaggtaac agtcaaggag accaaagaat ggtataagtt agtcggatac	17580
agtgccctga ttaaggacta attggttgaa ctccggaacc ctaatcctgc cctaggtggt	17640
taggcattat ttgcaatata ttaaagaaaa ctttgaaaat acgaagtttc tattcccagc	17700

tttgtctggt	ggccggcatg	gtcccagcct	cctcgctggc	gccggctggg	caacattccg	17760
aggggaccgt	cccctcggta	atggcgaaatg	ggacgcggcc	gatccggctg	ctaacaaagc	17820
ccgaaaggaa	gctgagttgg	ctgctgccac	cgctgagcaa	taactagcat	aaccccttgg	17880
ggcctctaaa	cgggtcttga	ggggtttttt	gctgaaagga	ggaactatat	ccggatgcgg	17940
ccgcggggccc	tatggtaccc	agctttttgtt	cccttttagtg	agggttaatt	ccgagcttgg	18000
cgtaatcatg	gtcatagctg	tttcctgtgt	gaaattgtta	tccgctcaca	attccacaca	18060
acataggagc	cggaagcata	aagtgtaaag	cctgggggtgc	ctaatagagt	aggtaactca	18120
cattaattgc	gttgcgctca	ctgcccgtt	tccagtcggg	aaacctgtcg	tgccagctgc	18180
attaatgaat	cggccaacgc	gcggggagag	gcggtttgcg	tattgggcgc	tcttccgctt	18240
cctcgctcac	tgactcgctg	cgctcggctg	ttcggctgcg	gcgagcggta	tcagctcact	18300
caaaggcggg	aatacggtta	tccacagaat	caggggataa	cgagggaaag	aacatgtgag	18360
caaaaggcca	gcaaaaggcc	aggaaccgta	aaaaggccgc	gttgctggcg	tttttccata	18420
ggctcggccc	ccctgacgag	catcacaaaa	atcgacgctc	aagtcagagg	tggcgaaacc	18480
cgacaggact	ataaagatac	caggcgttcc	cccctggaag	ctccctcgtg	cgctctcctg	18540
ttccgaccct	gccgcttacc	ggatacctgt	ccgcctttct	cccttcggga	agcgtggcgc	18600
tttctcaatg	ctcacgctgt	aggtatctca	gttcgggtgta	ggtcgttcgc	tccaagctgg	18660
gctgtgtgca	cgaaccccc	gttcagcccc	accgctgcgc	cttatccggg	aactatcgctc	18720
ttgagtccaa	cccggtaaga	cacgacttat	cgccactggc	agcagccact	ggtaacagga	18780
ttagcagagc	gaggtatgta	ggcgggtgta	cagagttctt	gaagtgggtg	cctaactacg	18840
gctacactag	aaggacagta	tttggtatct	gcgctctgct	gaagccagtt	accttcggaa	18900
aaagagttgg	tagctcttga	tccggcaaac	aaaccaccgc	tggtagcggg	ggtttttttg	18960
tttgcaagca	gcagattacg	cgagaaaaaa	aaggatctca	agaagatcct	ttgatctttt	19020
ctacggggtc	tgacgctcag	tggaacgaaa	actcacgtta	agggattttg	gtcatgagat	19080
tatcaaaaag	gatcttcacc	tagatccttt	taaattaaaa	atgaagtttt	aaatcaatct	19140
aaagtatata	tgagttaaact	tggcttgaca	gttaccaatg	cttaatcagt	gaggcaccta	19200
tctcagcgat	ctgtctattt	cgttcatcca	tagttgcctg	actgcccgtc	gtgtagataa	19260
ctacgatacg	ggagggtcta	ccatctggcc	ccagtgtgc	aatgataacc	cgagaccac	19320

gctcaccggc tccagattta tcagcaataa accagccagc cggaagggcc gagcgagaa	19380
gtggtcctgc aactttatcc gcctccatcc agtctattaa ttgttgccgg gaagctagag	19440
taagtagttc gccagttaat agtttgcgca acgttgttgc cattgctaca ggcatcgtgg	19500
tgtcacgctc gtcgtttggg atggcttcat tcagctccgg ttcccaacga tcaaggcgag	19560
ttacatgatc ccccatgttg tgaaaaaag cggttagctc cttcggtcct ccgatcgttg	19620
tcagaagtaa gttggccgca gtgttatcac tcatgcttat ggcagcactg cataattctc	19680
ttactgtcat gccatccgta agatgctttt ctgtgactgg tgagtactca accaagtcac	19740
tctgagaata gtgtatgcgg cgaccgagtt gctcttgccc ggcgtcaata cgggataata	19800
ccgcgccaca tagcagaact ttaaaagtgc tcatcattgg aaaacgttct tcggggcgaa	19860
aactctcaag gatcttaccg ctgttgagat ccagttcgat gtaaccact cgtgcaccca	19920
actgatcttc agcatctttt actttcacca gcgtttctgg gtgagcaaaa acaggaaggc	19980
aaaatgccgc aaaaaaggga ataaggcgca cacggaaatg ttgaatactc atactcttcc	20040
tttttcaata ttattgaagc atttatcagg gttattgtct catgagcgga tacatatttg	20100
aatgtattta gaaaaataaa caaatagggg ttccgcgcac atttccccga aaagtgccac	20160
ctgaaattgt aaacgttaat attttgtaa aattcgcggt aaatttttgt taaatcagct	20220
cattttttta ccaataggcc gaaatcggca aaatccctta taaatcaaaa gaatagaccg	20280
agataggggt gagtgttgtt ccagtttgga acaagagtcc actattaaag aacgtggact	20340
ccaacgtcaa agggcgaaaa accgtctatc agggcgatgg ccactacgt gaaccatcac	20400
cctaatacaag ttttttgggg tcgaggtgcc gtaaagcact aaatcggaac cctaaaggga	20460
gcccccgatt tagagcttga cggggaaagc cggcgaaagt ggcgagaaaag gaagggaaga	20520
aagcgaaagg agcgggctgt agggcgctgg caagtgtagc ggtcacgctg cgcgtaacca	20580
ccacaccgc cgcgcttaat gcgccgtac agggcgcgct ccattcgcca ttcaggctgc	20640
gcaactgttg ggaaggcgca tcggtgcggg cctcttcgct attacgccag ccaccgcggt	20700
g	20701

<210> 141
 <211> 20701
 <212> DNA
 <213> Artificial Sequence

<220>
<223> Complete optimised nucleotide sequence of the polynucleotide
encoding pTM-MVDVax8

<220>
<221> misc_feature
<222> (1)..(8)
<223> NotI

<220>
<221> misc_feature
<222> (9)..(28)
<223> T7 promoter

<220>
<221> misc_feature
<222> (29)..(82)
<223> Hammerhead ribozyme

<220>
<221> misc_feature
<222> (83)..(189)
<223> MV Leader and N promoter

<220>
<221> misc_feature
<222> (190)..(1767)
<223> MV N ORF

<220>
<221> misc_feature
<222> (1768)..(1888)
<223> MV N-P intergenic

<220>
<221> misc_feature
<222> (1889)..(3412)
<223> MV P ORF

<220>
<221> misc_feature
<222> (3413)..(3519)
<223> MV P-M intergenic

<220>
<221> misc_feature
<222> (3520)..(4527)
<223> MV M ORF

<220>
<221> misc_feature
<222> (4528)..(5530)
<223> MV M-F intergenic

```

<220>
<221> misc_feature
<222> (5531)..(7192)
<223> MV F ORF

<220>
<221> misc_feature
<222> (7193)..(7352)
<223> MV-F-H intergenic

<220>
<221> misc_feature
<222> (7353)..(9206)
<223> MV H ORF

<220>
<221> misc_feature
<222> (9207)..(9333)
<223> MV ATU3

<220>
<221> misc_feature
<222> (9334)..(10956)
<223> DENV1 NS polyepitope

<220>
<221> misc_feature
<222> (10957)..(11049)
<223> MV H-L intergenic

<220>
<221> misc_feature
<222> (11050)..(17601)
<223> MV L ORF

<220>
<221> misc_feature
<222> (17602)..(17710)
<223> MV Trailer

<220>
<221> misc_feature
<222> (17711)..(17794)
<223> HDV ribozyme

<220>
<221> misc_feature
<222> (17795)..(17936)
<223> T7 terminator

<220>
<221> misc_feature
<222> (17937)..(17944)

```

<223> Not I

<220>

<221> misc_feature

<222> (17945)..(20701)

<223> pTM plasmid

<400> 141

gcggccgcta atacgactca ctatagggcc aactttgttt ggtctgatga gtccgtgagg	60
acgaaacccg gagtcccggg tcaccaaaca aagttgggta aggatagttc aatcaatgat	120
catcttctag tgcacttagg attcaagatc ctattatcag ggacaagagc aggattaggg	180
atatccgaga tggccacact ttttaaggagc ttagcattgt tcaaaagaaa caaggacaaa	240
ccacccatta catcaggatc cggtaggagcc atcagaggaa tcaaacacat tattatagta	300
ccaatccctg gagattcctc aattaccact cgatccagac ttctggaccg gttggtgagg	360
ttaattggaa acccggatgt gagcggggccc aaactaacag gggcactaat aggtatatta	420
tccttatttg tggagtctcc aggtcaattg attcagagga tcaccgatga ccctgacgtt	480
agcataaggc tgtagaggt tgtccagagt gaccagtcac aatctggcct taccttcgca	540
tcaagaggta ccaacatgga ggatgaggcg gaccaatact tttcacatga tgatccaatt	600
agtagtgatc aatccaggtt cggatgggtt gggaacaagg aaatctcaga tattgaagtg	660
caagaccctg agggattcaa catgattctg ggtaccatcc tagcccaaatt ttgggtcttg	720
ctcgcaaagg cggttacggc cccagacacg gcagctgatt cggagctaag aaggtggata	780
aagtacaccc aacaaagaag ggtagttggg gaatttagat tggagagaaa atggttggat	840
gtggtgagga acaggattgc cgaggacctc tccttacgcc gattcatggt cgctctaadc	900
ctggatatca agagaacacc cggaaacaaa cccaggattg ctgaaatgat atgtgacatt	960
gatacatata tcgtagaggc aggattagcc agttttatcc tgactattaa gtttgggata	1020
gaaactatgt atcctgctct tggactgcat gaatttgctg gtgagttatc cacacttgag	1080
tccttgatga acctttacca gcaaattggg gaaactgcac cctacatggt aatcctggag	1140
aactcaattc agaacaagtt cagtgcagga tcataccctc tgctctggag ctatgccatg	1200
ggagtaggag tggaacttga aaactccatg ggaggtttga actttggccg atcttacttt	1260
gatccagcat attttagatt agggcaagag atggtaagga ggtcagctgg aaaggtcagt	1320
tccacattgg catctgaact cggatatcact gccgaggatg caaggcttgt ttcagagatt	1380

gcaatgcata ctactgagga caagatcagt agagcggttg gaccagaca agcccaagta	1440
tcattttctac acggtgatca aagtgagaat gagctaccga gattgggggg caaggaagat	1500
aggaggggtca aacagagtcg aggagaagcc agggagagct acagagaaac cgggcccagc	1560
agagcaagtg atgcgagagc tgcccatctt ccaaccggca caccctaga cattgacact	1620
gcaacggagt ccagccaaga tccgcaggac agtcgaaggt cagctgacgc cctgcttagg	1680
ctgcaagcca tggcaggaat ctcggaagaa caaggctcag acacggacac ccctatagt	1740
tacaatgaca gaaatcttct agactaggtg cgagaggccg agggccagaa caacatccgc	1800
ctaccatcca tcattgttat aaaaaactta ggaaccaggt ccacacagcc gccagcccat	1860
caaccatcca ctcccacgat tggagccaat ggcagaagag caggcacgcc atgtcaaaaa	1920
cggactggaa tgcattccggg ctctcaaggc cgagcccatt ggctcactgg ccatcgagga	1980
agctatggca gcatggtcag aaatatcaga caaccagga caggagcgag ccacctgcag	2040
ggaagagaag gcaggcagtt cgggtctcag caaacatgc ctctcagcaa ttggatcaac	2100
tgaaggcggg gcacctcgca tccgcgggtc gggacctgga gagagcgatg acgacgtga	2160
aactttggga atcccccaa gaaatctcca ggcattcaagc actgggttac agtgttatta	2220
cgtttatgat cacagcgggtg aagcgggtta gggaatccaa gatgctgact ctatcatggt	2280
tcaatcaggc cttgatgggtg atagaccct ctcaggagga gacaatgaat ctgaaaacag	2340
cgatgtggat attggcgaac ctgataccga gggatatgct atcactgacc ggggatctgc	2400
tcccatctct atgggggttca gggcttctga tgttgaaact gcagaaggag gggagatcca	2460
cgagctcctg agactccaat ccagaggcaa caactttccg aagcttggga aaactctcaa	2520
tgttcctccg ccccgacc cggtagggc cagcacttcc gggacacca ttaaaaagg	2580
cacagacgcg agattagcct catttggaac ggagatcgcg tctttattga cagggtgtgc	2640
aaccaatgt gtcgaaagt caccctcgga accatcaggg ccagggtgcac ctgcggggaa	2700
tgccccgag tgtgtgagca atgccgcact gatacaggag tggacacccg aatctggtac	2760
cacaatctcc ccgagatccc agaataatga agaaggggga gactattatg atgatgagct	2820
gttctctgat gtccaagata ttaaaacagc cttggccaaa atacacaggg ataatacagaa	2880
gataatctcc aagctagaat cactgctgtt attgaaggga gaagttgagt caattaagaa	2940
gcagatcaac aggcaaaata tcagcatatc caccctggaa ggacacctct caagcatcat	3000

gatcgccatt cctggacttg ggaaggatcc caacgacccc actgcagatg tcgaaatcaa	3060
tcccgacttg aaacccatca taggcagaga ttcaggccga gcactggccg aagtttctcaa	3120
gaaacccgtt gccagccgac aactccaagg aatgacaaat ggacggacca gttccagagg	3180
acagctgctg aaggaatttc agctaaagcc gatcgggaaa aagatgagct cagccgtcgg	3240
gtttgttcct gacaccggcc ctgcatcacg cagtgtaatc cgctccatta taaaatccag	3300
ccggctagag gaggatcgga agcgttacct gatgactctc cttgatgata tcaaaggagc	3360
caatgatctt gccaaagtcc accagatgct gatgaagata ataatgaagt agctacagct	3420
caacttacct gccaacccca tgccagtcga cccaactagt acaacctaaa tccattataa	3480
aaaacttagg agcaaagtga ttgcctcca aggtccacaa tgacagagac ctacgacttc	3540
gacaagtcgg catgggacat caaagggtcg atcgctccga tacaaccac cacctacagt	3600
gatggcaggc tggtgcccca ggtcagagtc atagatcctg gtctaggcga caggaaggat	3660
gaatgcttta tgtacatgtt tctgctgggg gttgttgagg acagcgattc cctagggcct	3720
ccaatcgggc gagcatttgg gttcctgccc ttaggtgttg gcagatccac agcaaagccc	3780
gaaaaactcc tcaaagaggc cactgagctt gacatagttg ttagacgtac agcagggtc	3840
aatgaaaaac tgggtgttcta caacaacacc ccactaactc tcctcacacc ttggagaaag	3900
gtcctaacaa caggagtggt cttcaacgca aaccaagtgt gcaatgcggt taatctgata	3960
ccgctcgata ccccgagag gttccgtgtt gtttatatga gcatcacccg tctttcggat	4020
aacgggtatt acaccgttcc tagaagaatg ctggaattca gatcgggtcaa tgcagtggcc	4080
ttcaacctgc tggtgaccct taggattgac aaggcgatag gccctgggaa gatcatcgac	4140
aatacagagc aacttcctga ggcaacattt atggtccaca tcgggaactt caggagaaag	4200
aagagtgaag tctactctgc cgattattgc aaaatgaaaa tcgaaaagat gggcctggtt	4260
tttgacttg gtgggatagg gggcaccagt cttcacatta gaagcacagg caaaatgagc	4320
aagactctcc atgcacaact cgggttcaag aagaccttat gttacccgct gatggatatc	4380
aatgaagacc ttaatcgatt actctggagg agcagatgca agatagtaag aatccaggca	4440
gttttgagc catcagttcc tcaagaattc cgcatttacg acgacgtgat cataaatgat	4500
gaccaaggac tattcaaagt tctgtagacc gtagtgccca gcaatgcccg aaaacgaccc	4560
ccctcacaat gacagccaga aggcccggac aaaaaagccc cctccgaaag actccacgga	4620

ccaagcgaga ggccagccag cagccgacgg caagcgcgaa caccaggcgg ccccagcaca	4680
gaacagccct gacacaaggc caccaccagc caccccaatc tgcatacctc tcgtgggacc	4740
cccgaggacc aaccccccaag gctgcccccg atccaaacca ccaaccgcat ccccaccacc	4800
cccgggaaag aaacccccag caattggaag gccctcccc ctcttcctca acacaagaac	4860
tccacaaccg aaccgcacaa gcgaccgagg tgaccaacc gcaggcatcc gactccctag	4920
acagatcctc tctccccggc aaactaaaca aaacttaggg ccaaggaaca tacacacca	4980
acagaacca gacccggcc cacggcgccg cgccccaac ccccgacaac cagagggagc	5040
ccccaacaa tcccgccggc tccccggtg cccacaggca gggacaccaa ccccgaaca	5100
gaccagcac ccaaccatcg acaatccaag acgggggggc cccccaaaa aaaggccccc	5160
aggggccgac agccagcacc gcgaggaagc ccaccaccc cacacacgac cacggcaacc	5220
aaaccagaac ccagaccacc ctggggccacc agctcccaga ctcggccatc accccgcaga	5280
aaggaaaggc cacaaccgc gcacccagc cccgatccgg cggggagcca cccaaccga	5340
accagcacc aagagcgatc cccgaaggac cccgaaccg caaaggacat cagtatcca	5400
cagcctctc aagtcccccg gtctctctc cttctcgaag ggacaaaag atcaatccac	5460
cacaccgac gacactcaac tccccaccc taaaggagac accgggaatc ccagaatcaa	5520
gactcatcca atgtccatca tgggtctcaa ggtgaacgtc tctgccatat tcatggcagt	5580
actgttaact ctcaaacac ccaccggtc aatccattgg ggcaatctct ctaagatagg	5640
ggtggtagga ataggaagt caagctacaa agttatgact cgttcagcc atcaatcatt	5700
agtcataaaa ttaatgcca atataactc cctcaataac tgcacgagg tagagattgc	5760
agaatacagg agactactga gaacagtttt ggaaccaatt agagatgcac ttaatgcaat	5820
gaccagaat ataagaccg ttcagagtgt agcttcaagt aggagacaca agagatttgc	5880
gggagtagtc ctggcaggtg cggccctagg cgttgccaca gctgctcaga taacagccgg	5940
cattgcactt caccagtcca tgctgaactc tcaagccatc gacaatctga gagcgagcct	6000
ggaaactact aatcaggcaa ttgagacaat cagacaagca gggcaggaga tgatattggc	6060
tgttcagggt gtccaagact acatcaataa tgagctgata ccgtctatga accaactatc	6120
ttgtgattta atcggccaga agctcgggct caaattgctc agatactata cagaaatcct	6180
gtcattattht ggccccagtt tacgggaccc catatctgcg gagatatcta tccaggcttt	6240

gagctatgcg cttggaggag acatcaataa ggtgttagaa aagctcggat acagtggagg	6300
tgatttactg ggcattcttag agagcggagg aataaaggcc cggataactc acgtcgacac	6360
agagtcctac ttcatgtgcc tcagtatagc ctatccgacg ctgtccgaga ttaagggggt	6420
gattgtccac cggctagagg gggctctcgta caacataggc tctcaagagt ggtataccac	6480
tgtgccaag tatgttgcaa cccaagggtta ctttatctcg aattttgatg agtcatcgtg	6540
tactttcatg ccagagggga ctgtgtgcag ccaaaatgcc ttgtaccga tgagtcctct	6600
gctccaagaa tgcctccggg ggtacaccaa gtcctgtgct cgtacactcg tatccgggtc	6660
ttttgggaac cggttcattt tatcacaagg gaacctata gccaatgtg catcaatcct	6720
ttgcaagtgt tacacaacag gaacgatcat taatcaagac cctgacaaga tcctaacata	6780
cattgctgcc gatcactgcc cggtagtcga ggtgaacggc gtgaccatcc aagtcgggag	6840
caggaggat ccagacgctg tgtacttgca cagaattgac ctcggtcctc ccatatcatt	6900
ggagagggtg gacgtaggga caaatctggg gaatgcaatt gctaagttgg aggatgcaa	6960
ggaattgttg gagtcatcgg accagatatt gaggagtatg aaaggtttat cgagcactag	7020
catagtctac atcctgattg cagtgtgtct tggagggttg atagggatcc ccgctttaat	7080
atgttgctgc agggggcggt gtaacaaaaa gggagaacaa gttggtatgt caagaccagg	7140
cctaaagcct gatcttacgg gaacatcaaa atcctatgta aggtcgctct gatcctctac	7200
aactcttgaa acacaaatgt cccacaagtc tcctcttcgt catcaagcaa ccaccgcacc	7260
cagcatcaag cccacctgaa attatctccg gcttccctct ggccgaacaa tatcggtagt	7320
taatcaaaac ttaggggtgca agatcatcca caatgtcacc acaacgagac cggataaatg	7380
ccttctacaa agataacccc catcccaagg gaagtaggat agtcattaac agagaacatc	7440
ttatgattga tagaccttat gttttgctgg ctgttctgtt tgtcatgttt ctgagcttga	7500
tcgggttgct agccattgca ggcattagac ttcacgggc agccatctac accgcagaga	7560
tccataaaaag cctcagcacc aatctagatg taactaactc aatcgagcat caggtcaagg	7620
acgtgctgac accactcttc aaaatcatcg gtgatgaagt gggcctgagg acacctcaga	7680
gattcactga cctagtgaaa ttaatctctg acaagattaa attccttaat ccggataggg	7740
agtacgactt cagagatctc acttggtgta tcaaccgcc agagagaatc aaattggatt	7800
atgatcaata ctgtgcagat gtggctgctg aagagctcat gaatgcattg gtgaactcaa	7860

ctctactgga gaccagaaca accaatcagt tcctagctgt ctcaaaggga aactgctcag	7920
ggcccactac aatcagaggt caattctcaa acatgtcgct gtccctgtta gacttgtatt	7980
taggtcgagg ttacaatgtg tcattctatag tcactatgac atcccaggga atgtatgggg	8040
gaacttacct agtggaaaag cctaattctga gcagcaaaag gtcagagttg tcacaactga	8100
gcatgtaccg agtgtttgaa gtaggtgtta tcagaaatcc gggtttgggg gctccggtgt	8160
tccatatgac aaactatctt gagcaaccag tcagtaatga tctcagcaac tgtatggtgg	8220
ctttggggga gctcaaaactc gcagcccttt gtcacgggga agattctatc acaattccct	8280
atcagggatc agggaaaggt gtcagcttcc agctcgtcaa gctaggtgtc tggaaatccc	8340
caaccgacat gcaatcctgg gtccccttat caacggatga tccagtata gacaggcttt	8400
acctctcatc tcacagaggt gttatcgctg acaatcaagc aaaatgggct gtcccgacaa	8460
cacgaacaga tgacaagttg cgaatggaga catgcttcca acaggcgtgt aagggtaaaa	8520
tccaagcact ctgcgagaat cccgagtggg caccattgaa ggataacagg attccttcat	8580
acggggtctt gtctgttgat ctgagtctga cagttgagct taaaatcaaa attgcttcgg	8640
gattcgggcc attgatcaca cacggttcag ggatggacct atacaaatcc aaccacaaca	8700
atgtgtattg gctgactatc ccgccaatga agaacctagc cttaggtgta atcaacacat	8760
tggagtggat accgagattc aaggttagtc cctacctctt cactgtcca attaaggaag	8820
caggcgaaga ctgccatgcc ccaacatacc tacctgcgga ggtggatggg gatgtcaaac	8880
tcagttccaa tctggtgatt ctacctggtc aagatctcca atatgttttg gcaacctacg	8940
atacttccag ggttgaacat gctgtggttt attacgttta cagcccaagc cgctcatttt	9000
cttactttta tccttttagg ttgcctataa aggggggtccc catcgaatta caagtggaat	9060
gcttcacatg ggacaaaaa ctctggtgcc gtcacttctg tgtgcttgcg gactcagaat	9120
ctggtggaca tatcactcac tctgggatgg tgggcatggg agtcagctgc acagtcaccc	9180
gggaagatgg aaccaatcgc agatagggt gctagtgaac caatcacatg atgtcaccca	9240
gacatcaggc ataccacta gtctaccctc catcattgtt ataaaaaact taggaaccag	9300
gtccacacag ccgccagccc atcaacgcgt acgatggcat cacaggaggg accactgccc	9360
gaaattgagg acgaagtgtt tagaaagcga aatctgacta ttatggacct gcaccccgga	9420
tctggcaaga cccggagata cctgccagcc atcgtgaggg aggctattaa gcggaaactg	9480

agaacactga	tcctggcccc	aactcgcgtg	gtcgcttccg	aaatggctga	ggccctgaaa	9540
ggcatgcccc	tccggtatca	gaccacagca	gtgaagtctg	aacataccgg	caaggagatt	9600
gtggacctga	tgtgccacgc	cactttcacc	atgcgactgc	tgagcccagt	gcgggtcccc	9660
aactacaata	tgatcattat	ggacgaggcc	cactttactg	atcccagctc	catcgccgct	9720
agaggatata	tttccaccag	ggtgggaatg	ggcgaggcag	cagctatctt	catgacagca	9780
actccccctg	gcagcgtgga	ggcatttcct	cagtccaacg	ccgtcatcca	ggacgaggag	9840
cgggacattc	ctgagcggag	ctggaattct	gggtacgaat	ggatcacaga	cgaggatcat	9900
gcacactgga	ctgaagccaa	gatgctgctg	gacaacatta	atactcctga	gggaatcatt	9960
ccagctctgt	tcgagcccga	aagagagaag	tctgcagcca	tcgacggcga	gtatagactg	10020
aggggagagg	cccggaagac	cttcgtggaa	ctgatgaggc	gcggcgatct	gcccgtgtgg	10080
ctgagttaca	aggtcgcttc	agagggattc	cagtatagtg	accgacggtg	gtgctttgat	10140
ggcgaacgca	acaatcaggt	gctggaggag	aacatggatg	tcgagatttg	gacaaaggaa	10200
ggcgagcggg	agaaactgcg	cccacgatgg	ctggacgctc	ggacttacag	cgatcccctg	10260
gcactgagag	aattcaaaga	gtttgctgca	gggggtggccg	tcgagaatca	ccatcacgcc	10320
gctatgctgg	acgtggatct	gcatcctgcc	agtgcttgga	ccctgtatgc	agtggccact	10380
accatcatta	ccccaatgat	gcgccacaca	atcgagaaca	caactgccaa	tatctcactg	10440
acagctattg	caaaccaggc	agccattctg	atgggactgg	acaaaggctg	gcccacagc	10500
aagatggata	ttggcgtgcc	tctgctggcc	ctgggggtgtt	acagtcaggt	gctggacatc	10560
attggccaga	ggatcgagaa	cattaagcat	gagcacaaat	caacctggca	ttacgacgaa	10620
gataatccct	ataagacatg	ggcctaccac	ggaagctatg	aggtgaaacc	ttcaggcagc	10680
gccagcagca	tggtcaacgg	ggtggtcaag	ctgctgacca	aaccttgga	cgtgatccca	10740
atggtcactc	agattgccat	gaccgatacc	acccatttcg	gccagcagcg	ggtgttcaag	10800
gagaagggtg	acacccgcac	acctaaggct	aaacgaggga	ctgcacagat	catggaggtg	10860
accgccaagt	ggctgtgggg	attcctgtcc	aggaacaaga	agccaagaat	ctgtaccagg	10920
gaagagttca	caagaaagg	ccggtcaaac	gcctaattgag	cgcgcagcgc	ttagacgtct	10980
cgcgatcgat	gctagtgtga	aatagacatc	agaattaaga	aaaacgtagg	gtccaagtgg	11040
ttccccgtta	tggactcgct	atctgtcaac	cagatcttat	accctgaagt	tcacctagat	11100

agcccgatag ttaccaataa gatagtagcc atcctggagt atgctcgagt ccctcacgct	11160
tacagcctgg aggaccctac actgtgtcag aacatcaagc accgcctaaa aaacggattt	11220
tccaaccaaa tgattataaa caatgtggaa gttgggaatg tcatcaagtc caagcttagg	11280
agttatccgg cccactctca tattccatat ccaaattgta atcaggattt atttaacata	11340
gaagacaaaag agtcaacgag gaagatccgt gaactcctca aaaaggggaa ttcgctgtac	11400
tccaaagtca gtgataaggt tttccaatgc ttaagggaca ctaactcacg gcttggccta	11460
ggctccgaat tgaggaggga catcaaggag aaagttatta acttgggagt ttacatgcac	11520
agctcccagt ggtttgagcc ctttctgttt tggtttacag tcaagactga gatgaggtca	11580
gtgattaaat cacaaacca tacttgccat aggaggagac acacacctgt attcttcact	11640
ggtagttcag ttgagttgct aatctctcgt gaccttgttg ctataatcag taaagagtct	11700
caacatgtat attacctgac atttgaactg gttttgatgt attgtgatgt catagagggg	11760
aggttaatga cagagaccgc tatgactatt gatgctaggt atacagagct tctaggaaga	11820
gtcagataca tgtggaaact gatagatggg ttcttccttg cactcgggaa tccaacttat	11880
caaattgtag ccatgctgga gcctctttca cttgcttacc tgcagctgag ggatataaca	11940
gtagaactca gaggtgcttt ccttaaccac tgctttactg aaatacatga tgttcttgac	12000
caaaacgggt tttctgatga aggtacttat catgagttaa ctgaagctct agattacatt	12060
ttcataactg atgacataca tctgacaggg gagattttct catttttcag aagtttcggc	12120
caccccgagc ttgaagcagt aacggctgct gaaaatgtta ggaaatacat gaatcagcct	12180
aaagtcattg tgtatgagac tctgatgaaa ggtcatgcc aatcataatc	12240
aacggctatc gtgacaggca cggaggcagt tggccaccgc tgaccctccc cctgcatgct	12300
gcagacacaa tccggaatgc tcaagcttca ggtgaagggt taacacatga gcagtgcgtt	12360
gataactgga aatcttttgc tggagtgaat tttggctgct ttatgcctct tagcctggat	12420
agtgatctga caatgtacct aaaggacaag gcacttgctg ctctccaaag ggaatgggat	12480
tcagtttacc cgaaagagtt cctgcgttac gaccctccca agggaaccgg gtcacggagg	12540
ctttagatg ttttccttaa tgattcgagc tttgacctat atgatgtgat aatgtatgtt	12600
gtaagtggag cttacctca tgaccctgag ttcaacctgt cttacagcct gaaagaaaag	12660
gagatcaagg aaacaggtag actttttgct aaaatgactt acaaaatgag ggcattgcaa	12720

gtgattgctg	aaaatcta	ctcaaacggg	attggcaa	attttaagga	caatgggatg	12780
gccaaggatg	agcacgattt	gactaaggca	ctccacactc	tagctgtctc	aggagtcccc	12840
aaagatctca	aagaaagtca	cagggggggg	ccagtcttaa	aaacctactc	ccgaagccca	12900
gtccacacaa	gtaccaggaa	cgtgagagca	gcaaaagggt	ttatagggtt	ccctcaagta	12960
attcggcagg	accaagacac	tgatcatccg	gagaatatgg	aagcttacga	gacagtcagt	13020
gcatttatca	cgactgatct	caagaagtac	tgctttaatt	ggagatatga	gaccatcagc	13080
ttgtttgcac	agaggctaaa	tgagatttac	ggattgccct	catttttcca	gtggctgcat	13140
aagaggcttg	agacctctgt	cctgtatgta	agtgaccctc	attgcccccc	cgaccttgac	13200
gccccatatcc	cgttatataa	agtccccaat	gatcaaactc	tcattaagta	ccctatggga	13260
ggtatagaag	ggtattgtca	gaagctgtgg	accatcagca	ccattcccta	tctatacctg	13320
gctgcttatg	agagcggagt	aaggattgct	tcgttagtgc	aaggggacaa	tcagaccata	13380
gccgtaacaa	aaagggtagc	cagcacatgg	ccctacaacc	ttaagaaacg	ggaagctgct	13440
agagtaacta	gagattactt	tgtaattctt	aggcaaaggc	tacatgatat	tggccatcac	13500
ctcaaggcaa	atgagacaat	tgtttcatca	catttttttg	tctattcaaa	aggaatatat	13560
tatgatgggc	tacttgtgtc	ccaatcactc	aagagcatcg	caagatgtgt	attctgggtca	13620
gagactatag	ttgatgaaac	aagggcagca	tgtagtaata	ttgctacaac	aatggctaaa	13680
agcatcgaga	gaggttatga	ccgttacctt	gcatattccc	tgaacgtcct	aaaagtgata	13740
cagcaaattc	tgatctctct	tggcttcaca	atcaattcaa	ccatgacccg	ggatgtagtc	13800
atacccctcc	tcacaaacaa	cgacctctta	ataaggatgg	cactgttgcc	cgctcctatt	13860
gggggggatga	attatctgaa	tatgagcagg	ctgtttgtca	gaaacatcgg	tgatccagta	13920
acatcatcaa	ttgctgatct	caagagaatg	attctcgcct	cactaatgcc	tgaagagacc	13980
ctccatcaag	taatgacaca	acaaccgggg	gactcttcat	tcctagactg	ggctagcgac	14040
ccttactcag	caaatcttgt	atgtgtccag	agcatcacta	gactcctcaa	gaacataact	14100
gcaaggtttg	tcctgatcca	tagtccaaac	ccaatgttaa	aaggattatt	ccatgatgac	14160
agtaaagaag	aggacgaggg	actggcggca	ttcctcatgg	acaggcatat	tatagtacct	14220
agggcagctc	atgaaatcct	ggatcatagt	gtcacagggg	caagagagtc	tattgcaggc	14280
atgctggata	ccacaaaagg	cttgattcga	gccagcatga	ggaagggggg	gttaacctct	14340

cgagtgataa ccagattgtc caattatgac tatgaacaat tcagagcagg gatggtgcta	14400
ttgacaggaa gaaagagaaa tgtcctcatt gacaaagagt catgttcagt gcagctggcg	14460
agagctctaa gaagccatat gtgggcgagg ctagctcgag gacggcctat ttacggcctt	14520
gaggtccctg atgtactaga atctatgcga ggccacctta ttcggcgtca tgagacatgt	14580
gtcatctgcg agtgtggatc agtcaactac ggatggtttt ttgtcccctc gggttgccaa	14640
ctggatgata ttgacaagga aacatcatcc ttgagagtcc catatatattgg ttctaccact	14700
gatgagagaa cagacatgaa gcttgccttc gtaagagccc caagtcgatc cttgcgatct	14760
gctgttagaa tagcaacagt gtactcatgg gcttacgggtg atgatgatag ctcttggaac	14820
gaagcctgggt tgttggctag gcaaagggcc aatgtgagcc tggaggagct aagggtgatc	14880
actcccatct caacttcgac taatttagcg cataggttga gggatcgtag cactcaagtg	14940
aaatactcag gtacatccct tgtccgagtg gcgaggtata ccacaatctc caacgacaat	15000
ctctcatttg tcatatcaga taagaagggt gatactaact ttatatacca acaaggaatg	15060
cttctagggt tgggtgtttt agaaacattg tttcgactcg agaaagatac cggatcatct	15120
aacacggtat tacatcttca cgtcgaaaca gattgttgcg tgatcccgat gatagatcat	15180
cccaggatac ccagctcccg caagctagag ctgagggcag agctatgtac caaccattg	15240
atatatgata atgcaccttt aattgacaga gatgcaacaa ggctatacac ccagagccat	15300
aggaggcacc ttgtggaatt tgttacatgg tccacacccc aactatatca catttttagct	15360
aagtccacag cactatctat gattgacctg gtaacaaaat ttgagaagga ccatatgaat	15420
gaaatttcag ctctcatagg ggatgacgat atcaatagtt tcataactga gtttctgctc	15480
atagagccaa gattattcac tatctacttg ggccagtgtg cggccatcaa ttgggcattt	15540
gatgtacatt atcatagacc atcagggaaa tatcagatgg gtgagctggt gtcacgttc	15600
ctttctagaa tgagcaaagg agtgtttaag gtgcttgta atgctctaag ccacccaaag	15660
atctacaaga aattctggca ttgtggtatt atagagccta tccatggtcc ttcacttgat	15720
gctcaaaact tgcacacaac tgtgtgcaac atggttttaca catgctatat gacctacctc	15780
gacctgttgt tgaatgaaga gttagaagag ttcacatttc tcttgtgtga aagcgacgag	15840
gatgtagtac cggacagatt cgacaacatc caggcaaaac acttatgtgt tctggcagat	15900
ttgtactgtc aaccaggac ctgcccacca attcgaggtc taagaccggt agagaaatgt	15960

gcagttctaa ccgaccatat caaggcagag gctatgttat ctccagcagg atcttcgtgg	16020
aacataaatc caattattgt agaccattac tcatgctctc tgacttatct ccggcgagga	16080
tcgatcaaac agataagatt gagagttgat ccaggattca ttttcgacgc cctcgctgag	16140
gtaaatgtca gtcagccaaa gatcggcagc aacaacatct caaatatgag catcaaggct	16200
ttcagacccc cacacgatga tgttgcaaaa ttgctcaaag atatcaacac aagcaagcac	16260
aatcttccca tttcaggggg caatctcgcc aattatgaaa tccatgcttt ccgcagaatc	16320
gggttgaact catctgcttg ctacaaagct gttgagatat caacattaat taggagatgc	16380
cttgagccag gggaggacgg cttgttcttg ggtgagggat cgggttctat gttgatcact	16440
tataaagaga tacttaaact aaacaagtgc ttctataata gtgggggtttc cgccaattct	16500
agatctggtc aaaggggaatt agcacctat ccctccgaag ttggccttgt cgaacacaga	16560
atgggagtag gtaatatgtt caaagtgtc tttaacggga ggcccgaagt cacgtgggta	16620
ggcagtgtag attgcttcaa tttcatagtt agtaatatcc ctaccttag tgtgggggttt	16680
atccattcag atatagagac cttgcctgac aaagatacta tagagaagct agaggaattg	16740
gcagccatct tatcgatggc tctgctcctg ggcaaaatag gatcaatact ggtgattaag	16800
cttatgcctt tcagcgggga ttttgttcag ggatttataa gttatgtagg gtctcattat	16860
agagaagtga accttgata ccctagatac agcaacttca tctctactga atcttatttg	16920
gttatgacag atctcaaggc taaccggcta atgaatcctg aaaagattaa gcagcagata	16980
attgaatcat ctgtgaggac ttcacctgga cttataggtc acatcctatc cattaagcaa	17040
ctaagctgca tacaagcaat tgtgggagac gcagttagta gaggtgatat caatcctact	17100
ctgaaaaaac ttacacctat agagcaggtg ctgatcaatt gcgggttggc aattaacgga	17160
cctaagctgt gcaaagaatt gatccaccat gatgttgcct cagggaaga tggattgctt	17220
aattctatac tcatcctcta caggaggtt gcaagattca aagacaacca aagaagtcaa	17280
caagggatgt tccacgctta ccccgatttg gtaagtagca ggcaacgaga acttatatct	17340
aggatcacc gcaaattctg ggggcacatt cttctttact ccgggaacaa aaagttgata	17400
aataagttta tccagaatct caagtccggc tatctgatac tagacttaca ccagaatatc	17460
ttcgtaaga atctatcaa gtcagagaaa cagattatta tgacgggggg tttgaaacgt	17520
gagtgggttt ttaaggtaac agtcaaggag accaaagaat ggtataagtt agtcggatac	17580

agtgccctga ttaaggacta attggttgaa ctccggaacc ctaatcctgc cctaggtggt	17640
taggcattat ttgcaatata ttaaagaaaa ctttgaaaat acgaagtttc tattcccagc	17700
tttgtctggt ggccggcatg gtcccagcct cctcgctggc gccggctggg caacattccg	17760
aggggaccgt cccctcggta atggcgaatg ggacgcggcc gatccggctg ctaacaaagc	17820
ccgaaaggaa gctgagttgg ctgctgccac cgctgagcaa taactagcat aacccttgg	17880
ggcctctaaa cgggtcttga ggggtttttt gctgaaagga ggaactatat ccggatgcgg	17940
ccgcggggccc tatggtaccc agcttttgtt ccctttagtg agggttaatt ccgagcttgg	18000
cgtaatcatg gtcatactg tttcctgtgt gaaattgtta tccgctcaca attccacaca	18060
acataggagc cggaagcata aagtgtaaag cctgggggtgc ctaatgagtg aggttaactca	18120
cattaattgc gttgcgctca ctgcccgtt tccagtcggg aaacctgtcg tgccagctgc	18180
attaatgaat cggccaacgc gcggggagag gcggtttgctg tattgggcgc tcttccgctt	18240
cctcgctcac tgactcgctg cgctcggtcg ttcggctgctg gcgagcggtg tcagctcact	18300
caaaggcggg aatacgggta tccacagaat caggggataa cgcaggaaaag aacatgtgag	18360
caaaaggcca gcaaaaggcc aggaaccgta aaaaggccgc gttgctggcg tttttccata	18420
ggctcggccc ccctgacgag catcacaaaa atcgacgctc aagtcagagg tggcgaaacc	18480
cgacaggact ataaagatac caggcgttcc cccctggaag ctccctcgtg cgctctcctg	18540
ttccgaccct gccgcttacc ggatacctgt ccgcctttct cccttcggga agcgtggcgc	18600
tttctcaatg ctacgctgt aggtatctca gttcgggtgta ggtcgttcgc tccaagctgg	18660
gctgtgtgca cgaaccccc gttcagcccc accgctgcgc cttatccggt aactatcgtc	18720
ttgagtccaa cccggtgaaga cacgacttat cgccactggc agcagccact ggtaacagga	18780
ttagcagagc gaggtatgta ggcggtgcta cagagttctt gaagtgggtg cctaactacg	18840
gtacactag aaggacagta tttggtatct gcgctctgct gaagccagtt accttcggaa	18900
aaagagttgg tagctcttga tccggcaaac aaaccaccgc tggtagcggg ggtttttttg	18960
tttgcaagca gcagattacg cgcagaaaaa aaggatctca agaagatcct ttgatctttt	19020
ctacgggggtc tgacgctcag tggaacgaaa actcacgtta agggattttg gtcatgagat	19080
tatcaaaaag gatcttcacc tagatccttt taaattaaaa atgaagtttt aaatcaatct	19140
aaagtatata tgagtaaact tggctctgaca gttaccaatg cttaatcagt gaggcaccta	19200

tctcagcgat ctgtctattht cgtttcatcca tagttgcctg actgcccgtc gtgtagataa	19260
ctacgatacg ggagggctta ccatctggcc ccagtgtctg aatgataccg cgagaccac	19320
gctcaccggc tccagattta tcagcaataa accagccagc cggaagggcc gagcgcagaa	19380
gtggtcctgc aactttatcc gcctccatcc agtctattaa ttgttgccgg gaagctagag	19440
taagtagttc gccagttaat agtttgcgca acgttgttgc cattgctaca ggcatcgtgg	19500
tgtcacgctc gtcgtttgggt atggcttcat tcagctccgg ttcccaacga tcaaggcgag	19560
ttacatgatc ccccatgttg tgaaaaaaag cggttagctc cttcggtcct ccgatcgttg	19620
tcagaagtaa gttggccgca gtgttatcac tcatgcttat ggcagcactg cataattctc	19680
ttactgtcat gccatccgta agatgctttt ctgtgactgg tgagtactca accaagtcatt	19740
tctgagaata gtgtatgcgg cgaccgagtt gctcttgccc ggcgtcaata cgggataata	19800
ccgcgccaca tagcagaact ttaaaagtgc tcatcattgg aaaacgttct tcggggcgaa	19860
aactctcaag gatcttaccg ctgttgagat ccagttcgat gtaaccact cgtgcaccca	19920
actgatcttc agcatctttt actttcacca gcgtttctgg gtgagcaaaa acaggaaggc	19980
aaaatgccgc aaaaaaggga ataaggcgca cacggaaatg ttgaatactc atactcttcc	20040
tttttcaata ttattgaagc atttatcagg gttattgtct catgagcgga tacatatttg	20100
aatgtattta gaaaaataaa caaatagggg ttccgcgcac atttccccga aaagtgccac	20160
ctgaaattgt aaacgttaat attttgtaa aattcgcgtt aaatttttgt taaatcagct	20220
cattttttta ccaataggcc gaaatcggca aaatccctta taaatcaaaa gaatagaccg	20280
agatagggtt gagtgttggt ccagtttgga acaagagtcc actattaaag aacgtggact	20340
ccaacgtcaa agggcgaaaa accgtctatc agggcgatgg ccactacgt gaaccatcac	20400
cctaatacaag ttttttgggg tcgaggtgcc gtaaagcact aaatcggaac cctaaaggga	20460
gccccgatt tagagcttga cggggaaagc cggcgaacgt ggcgagaaaag gaagggaaga	20520
aagcgaaagg agcgggctgt agggcgctgg caagtgtagc ggtcacgtg cgcgtaacca	20580
ccacacccgc cgcgcttaat gcgccgtac agggcgcgct ccattcgcca ttcaggctgc	20640
gcaactgttg ggaaggcgca tcggtgcggg cctcttcgct attacgccag ccaccgcggt	20700
g	20701

<211> 22261
<212> DNA
<213> Artificial Sequence

<220>
<223> Complete optimised nucleotide sequence of the polynucleotide
encoding pTM-MVDVax9

<220>
<221> misc_feature
<222> (1)..(8)
<223> NotI

<220>
<221> misc_feature
<222> (9)..(28)
<223> T7 promoter

<220>
<221> misc_feature
<222> (29)..(82)
<223> Hammerhead ribozyme

<220>
<221> misc_feature
<222> (83)..(189)
<223> MV Leader and N promoter

<220>
<221> misc_feature
<222> (190)..(1767)
<223> MV N ORF

<220>
<221> misc_feature
<222> (1768)..(1888)
<223> MV N-P intergenic

<220>
<221> misc_feature
<222> (1889)..(3412)
<223> MV P ORF

<220>
<221> misc_feature
<222> (3413)..(3531)
<223> MV ATU2

<220>
<221> misc_feature
<222> (3532)..(6717)
<223> DENV tetra EDIII/ectoM/DENV1 NS polyepitope

<220>
<221> misc_feature
<222> (6718)..(6813)
<223> MV P-M intergenic

<220>
<221> misc_feature
<222> (6814)..(7821)
<223> MV M ORF

<220>
<221> misc_feature
<222> (7822)..(8824)
<223> MV M-F intergenic

<220>
<221> misc_feature
<222> (8825)..(10486)
<223> MV F ORF

<220>
<221> misc_feature
<222> (10487)..(10646)
<223> MV-F-H intergenic

<220>
<221> misc_feature
<222> (10647)..(12500)
<223> MV H ORF

<220>
<221> misc_feature
<222> (12501)..(12609)
<223> MV H-L intergenic

<220>
<221> misc_feature
<222> (12610)..(19161)
<223> MV L ORF

<220>
<221> misc_feature
<222> (19162)..(19270)
<223> MV Trailer

<220>
<221> misc_feature
<222> (19271)..(19354)
<223> HDV ribozyme

<220>
<221> misc_feature
<222> (19355)..(19496)
<223> T7 terminator

<220>
<221> misc_feature
<222> (19497)..(19504)
<223> Not I

<220>
<221> misc_feature
<222> (19506)..(22261)
<223> pTM plasmid

<400> 142
gcggccgcta atacgactca ctatagggcc aactttgttt ggtctgatga gtccgtgagg 60
acgaaacccg gagtcccggg tcaccaaaca aagttgggta aggatagttc aatcaatgat 120
catcttctag tgcacttagg attcaagatc ctattatcag ggacaagagc aggattaggg 180
atatccgaga tggccacact ttttaaggagc ttagcattgt tcaaaagaaa caaggacaaa 240
ccaccatta catcaggatc cgggtggagcc atcagaggaa tcaaacacat tattatagta 300
ccaatccctg gagattcctc aattaccact cgatccagac ttctggaccg gttggtgagg 360
ttaattggaa acccggatgt gagcgggccc aaactaacag gggcactaat aggtatatta 420
tccttatttg tggagtctcc aggtcaattg attcagagga tcaccgatga ccctgacgtt 480
agcataaggc tgtagaggt tgtccagagt gaccagtcac aatctggcct taccttcgca 540
tcaagaggta ccaacatgga ggatgaggcg gaccaatact tttcacatga tgatccaatt 600
agtagtgatc aatccagggt cggatggttc gggaacaagg aaatctcaga tattgaagtg 660
caagaccctg agggattcaa catgattctg ggtaccatcc tagcccaaatt ttgggtcttg 720
ctcgcaaagg cggttacggc cccagacacg gcagctgatt cggagctaag aaggtggata 780
aagtacaccc aacaaagaag ggtagttggt gaatttagat tggagagaaa atggttgat 840
gtggtgagga acaggattgc cgaggacctc tccttacgcc gattcatggt cgctctaadc 900
ctggatatca agagaacacc cggaaacaaa cccaggattg ctgaaatgat atgtgacatt 960
gatacatata tcgtagaggc aggattagcc agttttatcc tgactattaa gtttgggata 1020
gaaactatgt atcctgctct tggactgcat gaatttgctg gtgagttatc cacacttgag 1080
tccttgatga acctttacca gcaaatgggg gaaactgcac cctacatggt aatcctggag 1140
aactcaattc agaacaagtt cagtgacagga tcataccctc tgctctggag ctatgccatg 1200
ggagtaggag tggaacttga aaactccatg ggaggtttga actttggccg atcttacttt 1260

gatccagcat attttagatt agggcaagag atggtaagga ggtcagctgg aaaggtcagt	1320
tccacattgg catctgaact cggtatcact gccgaggatg caaggcttgt ttcagagatt	1380
gcaatgcata ctactgagga caagatcagt agagcggttg gaccagaca agcccaagta	1440
tcatttctac acggtgatca aagtgagaat gagctaccga gattgggggg caaggaagat	1500
aggaggggtca aacagagtcg aggagaagcc agggagagct acagagaaac cgggcccagc	1560
agagcaagtg atgcgagagc tgcccatctt ccaaccggca caccctaga cattgacact	1620
gcaacggagt ccagccaaga tccgcaggac agtcgaaggt cagctgacgc cctgcttagg	1680
ctgcaagcca tggcaggaat ctcggaagaa caaggctcag acacggacac ccctatagt	1740
tacaatgaca gaaatcttct agactaggtg cgagaggccg agggccagaa caacatccgc	1800
ctaccatcca tcattgttat aaaaaactta ggaaccaggt ccacacagcc gccagcccat	1860
caaccatcca ctcccacgat tggagccaat ggcagaagag caggcacgcc atgtcaaaaa	1920
cggactggaa tgcatccggg ctctcaaggc cgagcccatt ggctcactgg ccatcgagga	1980
agctatggca gcatggtcag aaatatcaga caaccagga caggagcgag ccacctgcag	2040
ggaagagaag gcaggcagtt cgggtctcag caaacatgc ctctcagcaa ttggatcaac	2100
tgaaggcggg gcacctcgca tccgcgggtc gggacctgga gagagcgatg acgacgtga	2160
aactttggga atcccccaa gaaatctcca ggcataagc actgggttac agtgttatta	2220
cgtttatgat cacagcgggtg aagcgggtta gggaatcaa gatgctgact ctatcatggt	2280
tcaatcaggc cttgatgggtg atagcaccct ctgaggagga gacaatgaat ctgaaaacag	2340
cgatgtggat attggcgaac ctgataccga gggatatgct atcactgacc ggggatctgc	2400
tcccatctct atgggggttca gggcttctga tgttgaaact gcagaaggag gggagatcca	2460
cgagctcctg agactccaat ccagaggcaa caactttccg aagcttggga aaactctcaa	2520
tgttcctccg ccccgacc cggtagggc cagcacttcc gggacacca ttaaaaagg	2580
cacagacgcg agattagcct catttggaac ggagatcgcg tctttattga caggtggtgc	2640
aaccaatgt gtcgaaagt caccctcgga accatcaggg ccaggtgcac ctgcggggaa	2700
tgtccccgag tgtgtgagca atgccgcact gatacaggag tggacacccg aatctggtac	2760
cacaatctcc ccgagatccc agaataatga agaaggggga gactattatg atgatgagct	2820
gttctctgat gtccaagata ttaaaacagc cttggccaaa atacacgagg ataatcagaa	2880

gataatctcc aagctagaat cactgctgtt attgaaggga gaagttgagt caattaagaa	2940
gcagatcaac aggcaaaata tcagcatatc caccctggaa ggacacctct caagcatcat	3000
gatcgccatt cctggacttg ggaaggatcc caacgacccc actgcagatg tcgaaatcaa	3060
tcccgacttg aaacccatca taggcagaga ttcaggccga gcactggccg aagtttctcaa	3120
gaaacccgtt gccagccgac aactccaagg aatgacaaat ggacggacca gttccagagg	3180
acagctgctg aaggaatttc agctaaagcc gatcgggaaa aagatgagct cagccgtcgg	3240
gtttgttcct gacaccggcc ctgcatcacg cagtgtaatc cgctccatta taaaatccag	3300
ccggctagag gaggatcgga agcgttacct gatgactctc cttgatgata tcaaaggagc	3360
caatgatctt gccaaagttcc accagatgct gatgaagata ataatgaagt agctacagct	3420
caacttacct gccaacccca tgccagtcga cccaactagc ctaccctcca tcattgttat	3480
aaaaaactta ggaaccaggt ccacacagcc gccagcccat caacgcgtac gatgggcatc	3540
atattcattc ttcttatgct ggttacaccg tctatggcgg agaaacttcg aatcaaaggt	3600
atgagctata cgatgtgcag cggcaagttc aagatcgaga aggaaatggc tgaaaccag	3660
cacggtacaa ctgtgggtcaa agtcaaatat gagggggctg gcgctccctg taaagtaccc	3720
attgagatta gggacgtcaa taaagagaag gtggtaggtc gcatcatctc cagtacacct	3780
ttggccgaga acacgaactc cgtcacaaac atagagttgg aacccccgtt cggagactca	3840
tacattgtga tcgggggtggg caactctgca ctcacactgc attgggttcaa gaagggaagc	3900
agtatcggcc gcagggataa gagagacaaa ctgaaattga aaggtatgtc ctatgccatg	3960
tgcacgaata ctttcgttct caagaaagaa gtatctgaga ctcagcacgg aaccatcctg	4020
atcaaagtcg agtacaaagg agaagacgtg ccctgtaaga tcccattcag taccgaggat	4080
ggacagggca aggcccataa cggcaggctg ataaccgcca accctgtggt taaaaagaag	4140
gaagagccag tcaatatcga agctgagcca ccgttcgggg agagcaacat agtaattggc	4200
ataggggata atgctttgaa gatcaactgg tacaagaaag gaagctccat tggccgaaga	4260
gataagcgcg acaaactcca gctgaaagga atgagctact ccatgtgtac tgggaagttc	4320
aagattgtca aggaaatcgc cgaaactcag catggcacta ttgtgatccg cgtgcagtat	4380
gaaggcgatg gtagcccctg caagatacca tttgaaatca ccgatttgga gaaacggcac	4440
gtcctgggtc ggctcattac cgtgaacca atcgtgaccg agaaggacag tccagttaat	4500

atcgaggccg agcctccttt cggcgacagt tacatcattg taggggtgga accagggcaa	4560
ctgaagctga actggttcaa gaaaggcagc agtataggac ggcgggataa acgggacaaa	4620
ctcacactga aaggcatgtc atacgttatg tgcaccggct cattcaaact ggagaaggaa	4680
gttgagaga cacagcatgg gaccgtgctc gtgcaggtca aatacgaggg caccgacgct	4740
ccttgcaaga ttccgttcag tacacaggac gagaaaggcg tgactcagaa cggcagattg	4800
attacagcga accctatcgt gactgacaag gagaagccag ttaacatcga gactgagccg	4860
cctttcggag aatcatacat tatcgtggga gccggcgaga aggcactgaa actcagctgg	4920
ttcaagaagg gcagctcaat cggtcggaga gacaagcggc ctgtcgccct cgcaccgcac	4980
gtgggcctgg gtctggaaac gaggaccgag acgtggatga gttccgaagg cgcattggaag	5040
caaatccaga aagtggagac gtgggcctc aggcattccgc ggagagataa acgagcatca	5100
caggagggac cactgcccga aattgaggac gaagtgttta gaaagcgaaa tctgactatt	5160
atggacctgc accccggatc tggcaagacc cggagatacc tgccagccat cgtgagggag	5220
gctattaagc ggaaactgag aacctgac ctggcccca ctcgcgtggc cgcttccgaa	5280
atggctgagg ccctgaaagg catgcccac cggatcaga ccacagcagt gaagtctgaa	5340
cataccggca aggagattgt ggacctgatg tgccacgcca ctttcacat gcgactgctg	5400
agcccagtgc ggggtcccaa ctacaatatg atcattatgg acgaggcca ctttactgat	5460
cccagctcca tcgccgctag aggatatatt tccaccaggg tgggaatggg cgaggcagca	5520
gctatcttca tgacagcaac tccccctggc agcgtggagg catttcctca gtccaacgcc	5580
gtcatccagg acgaggagcg ggacattcct gagcggagct ggaattctgg gtacgaatgg	5640
atcacagacg aggatcatgc aactggact gaagccaaga tgctgctgga caacattaat	5700
actcctgagg gaatcattcc agctctgttc gagcccgaaa gagagaagtc tgcagccatc	5760
gacggcgagt atagactgag gggagaggcc cggaagacct tcgtggaact gatgaggcgc	5820
ggcgatctgc ccgtgtggct gagttacaag gtcgcttcag agggattcca gtatagtac	5880
cgacggtggc gctttgatgg cgaacgcaac aatcaggtgc tggaggagaa catggatgtc	5940
gagatttga caaaggaagg cgagcgggaag aaactgcgcc cacgatggct ggacgctcgg	6000
acttacagcg atccccctggc actgagagaa ttcaaagagt ttgctgcagg ggtggccgtc	6060
gagaatcacc atcacgccgc tatgctggac gtggatctgc atcctgccag tgcttgacc	6120

ctgtatgcag tggccactac catcattacc ccaatgatgc gccacacaat cgagaacaca	6180
actgccaaata tctcactgac agctattgca aaccaggcag ccattctgat gggactggac	6240
aaaggctggc ccatcagcaa gatggatatt ggcgtgcctc tgctggccct ggggtgttac	6300
agtcagggtgc tggacatcat tggccagagg atcgagaaca ttaagcatga gcacaaatca	6360
acctggcatt acgacgaaga taatccctat aagacatggg cctaccacgg aagctatgag	6420
gtgaaacctt caggcagcgc cagcagcatg gtcaacgggg tggtaagct gctgacaaa	6480
ccttgggacg tgatcccaat ggtcactcag attgccatga ccgataccac cccattcggc	6540
cagcagcggg tgttcaagga gaagggtggac acccgcacac ctaaggctaa acgagggact	6600
gcacagatca tggaggtgac cgccaagtgg ctgtggggat tcctgtccag gaacaagaag	6660
ccaagaatct gtaccaggga agagttcaca agaaagggtcc ggtcaaacgc ctaatgagcg	6720
cgcagcgctt agacgtctcg cgatcgatac tagtacaacc taaatccatt ataaaaaact	6780
taggagcaaa gtgattgcct cccaagggtcc acaatgacag agacctacga cttcgacaag	6840
tcggcatggg acatcaaagg gtcgatcgct ccgatacaac ccaccaccta cagtgatggc	6900
aggctgggtgc cccagggtcag agtcatagat cctgggtctag gcgacaggaa ggatgaatgc	6960
tttatgtaca tgtttctgct gggggttgtt gaggacagcg attccctagg gcctccaatc	7020
gggcgagcat ttgggttcct gcccttaggt gttggcagat ccacagcaaa gcccgaaaaa	7080
ctcctcaaag aggccactga gcttgacata gttgttagac gtacagcagg gctcaatgaa	7140
aaactgggtgt tctacaacaa caccacctta actctcctca caccttggag aaaggtccta	7200
acaacaggga gtgtcttcaa cgcaaacca gtgtgcaatg cggttaatct gataccgctc	7260
gatacccccgc agaggttccg tgttgtttat atgagcatca cccgtctttc ggataacggg	7320
tattacaccg ttcctagaag aatgctggaa ttcagatcgg tcaatgcagt ggccttcaac	7380
ctgctgggtga cccttaggat tgacaaggcg ataggccctg ggaagatcat cgacaataca	7440
gagcaacttc ctgaggcaac atttatggtc cacatcggga acttcaggag aaagaagagt	7500
gaagtctact ctgccgatta ttgcaaaatg aaaatcgaaa agatgggcct ggtttttgca	7560
cttgggtggga tagggggcac cagtcttcac attagaagca caggcaaaat gagcaagact	7620
ctccatgcac aactcgggtt caagaagacc ttatgttacc cgctgatgga tatcaatgaa	7680
gaccttaatc gattactctg gaggagcaga tgcaagatag taagaatcca ggcagttttg	7740

cagccatcag	ttcctcaaga	attccgcatt	tacgacgacg	tgatcataaa	tgatgaccaa	7800
ggactattca	aagttctgta	gaccgtagtg	cccagcaatg	cccgaaaacg	acccccctca	7860
caatgacagc	cagaaggccc	ggacaaaaaa	gccccctccg	aaagactcca	cggaccaagc	7920
gagaggccag	ccagcagccg	acggcaagcg	cgaacaccag	gcggccccag	cacagaacag	7980
ccctgacaca	aggccaccac	cagccacccc	aatctgcatc	ctcctcgtgg	gacccccgag	8040
gaccaacccc	caaggctgcc	cccgatccaa	accaccaacc	gcatccccac	cacccccggg	8100
aaagaaaccc	ccagcaattg	gaaggcccct	ccccctcttc	ctcaacacaa	gaactccaca	8160
accgaaccgc	acaagcgacc	gaggtgaccc	aaccgcaggc	atccgactcc	ctagacagat	8220
cctctctccc	cggcaaacta	aacaaaactt	agggccaaagg	aacatacaca	cccaacagaa	8280
cccagacccc	ggcccacggc	gccgcgcccc	caacccccga	caaccagagg	gagcccccaa	8340
ccaatcccg	cggctcccc	ggtgcccaca	ggcagggaca	ccaacccccg	aacagaccca	8400
gcaccaacc	atcgacaatc	caagacgggg	gggccccccc	aaaaaaaggc	ccccaggggc	8460
cgacagccag	caccgcgagg	aagcccaccc	acccacaca	cgaccacggc	aaccaaacca	8520
gaaccagac	caccctgggc	caccagctcc	cagactcggc	catcaccccg	cagaaaggaa	8580
aggccacaac	ccgcgcaccc	cagccccgat	ccggcgggga	gccaccaaac	ccgaaccagc	8640
acccaagagc	gatccccgaa	ggacccccga	accgcaaagg	acatcagtat	cccacagcct	8700
ctccaagtcc	cccggctctc	tcctcttttc	gaagggacca	aaagatcaat	ccaccacacc	8760
cgacgacact	caactcccca	cccctaaagg	agacaccggg	aatcccagaa	tcaagactca	8820
tccaatgtcc	atcatgggtc	tcaaggtgaa	cgtctctgcc	atattcatgg	cagtactgtt	8880
aactctccaa	acaccaccg	gtcaaattcca	ttggggcaat	ctctctaaga	taggggtggt	8940
aggaatagga	agtgcaagct	acaaagttat	gactcgttcc	agccatcaat	cattagtcac	9000
aaaattaatg	cccaatataa	ctctcctcaa	taactgcacg	agggtagaga	ttgcagaata	9060
caggagacta	ctgagaacag	ttttggaacc	aattagagat	gcacttaatg	caatgaccca	9120
gaatataaga	ccggttcaga	gtgtagcttc	aagtaggaga	cacaagagat	ttgcgggagt	9180
agtcctggca	ggtgcggccc	taggcgttgc	cacagctgct	cagataacag	ccggcattgc	9240
acttcaccag	tccatgctga	actctcaagc	catcgacaat	ctgagagcga	gccttgaaac	9300
tactaatcag	gcaattgaga	caatcagaca	agcagggcag	gagatgatat	tggctgttca	9360

gggtgtccaa gactacatca ataatgagct gataccgtct atgaaccaac tatcttgtga	9420
tttaatcggc cagaagctcg ggctcaaatt gctcagatac tatacagaaa tcctgtcatt	9480
at ttggcccc agtttacggg accccatatc tgcggagata tctatccagg ctttgagcta	9540
tgcgcttgga ggagacatca ataaggtgtt agaaaagctc ggatacagtg gaggtgattt	9600
actgggcatc ttagagagcg gaggaataaa ggcccggata actcacgtcg acacagagtc	9660
ctacttcatt gtcctcagta tagcctatcc gacgctgtcc gagattaagg gggtgattgt	9720
ccaccggcta gaggggggtct cgtacaacat aggctctcaa gagtgggtata ccactgtgcc	9780
caagtatgtt gcaacccaag ggtaccttat ctcgaatttt gatgagtcac cgtgtacttt	9840
catgccagag gggactgtgt gcagccaaaa tgccttgtac ccgatgagtc ctctgctcca	9900
agaatgcctc cgggggtaca ccaagtcctg tgctcgtaca ctcgtatccg ggtcttttgg	9960
gaaccggttc attttatcac aagggaacct aatagccaat tgtgcatcaa tcctttgcaa	10020
gtgttacaca acaggaacga tcattaatca agaccctgac aagatcctaa catacattgc	10080
tgccgatcac tgcccggtag tcgaggtgaa cggcgtgacc atccaagtcg ggagcaggag	10140
gtatccagac gctgtgtact tgcacagaat tgacctcggc cctcccatat cattggagag	10200
gttggacgta gggacaaatc tggggaatgc aattgctaag ttggaggatg ccaaggaatt	10260
gttggagtca tcggaccaga tattgaggag tatgaaaggt ttatcgagca ctagcatagt	10320
ctacatcctg attgcagtgt gtcttggagg gttgataggg atccccgctt taatatgttg	10380
ctgcaggggg cgttgtaaca aaaagggaga acaagttggc atgtcaagac caggcctaaa	10440
gcctgatctt acgggaacat caaaatccta tgtaaggctc ctctgatcct ctacaactct	10500
tgaaacacaa atgtcccaca agtctcctct tcgtcatcaa gcaaccaccg caccagcat	10560
caagcccacc tgaaattatc tccggcttcc ctctggccga acaatatcgg tagttaatca	10620
aaacttaggg tgcaagatca tccacaatgt caccacaacg agaccggata aatgccttct	10680
acaaagataa ccccatccc aagggaagta ggatagtcac taacagagaa catcttatga	10740
ttgatagacc ttatgttttg ctggctgttc tgtttgtcat gtttctgagc ttgatcgggt	10800
tgctagccat tgcaggcatt agacttcatc gggcagccat ctacaccgca gagatccata	10860
aaagcctcag caccaatcta gatgtaacta actcaatcga gcatcaggtc aaggacgtgc	10920
tgacaccact cttcaaaatc atcgggtgatg aagtgggcct gaggacacct cagagattca	10980

ctgacctagt gaaattaatc tctgacaaga ttaaattcct taatccggat agggagtagc	11040
acttcagaga tctcacttgg tgtatcaacc cgccagagag aatcaaattg gattatgac	11100
aatactgtgc agatgtggct gctgaagagc tcatgaatgc attggtgaac tcaactctac	11160
tggagaccag aacaaccaat cagttcctag ctgtctcaaa gggaaactgc tcagggccca	11220
ctacaatcag aggtcaattc tcaaacatgt cgctgtccct gttagacttg tatttaggtc	11280
gaggttacaa tgtgtcatct atagtcacta tgacatccca gggaatgtat gggggaactt	11340
acntagtgga aaagccta atctgagcagca aaaggtcaga gttgtcacia ctgagcatgt	11400
accgagtgtt tgaagtaggt gttatcagaa atccgggttt gggggctccg gtgttccata	11460
tgacaaacta tcttgagcaa ccagtcagta atgatctcag caactgtatg gtggcttttg	11520
gggagctcaa actcgcagcc ctttgtcacg gggaagattc tatcacaatt ccctatcagg	11580
gatcagggaa aggtgtcagc ttccagctcg tcaagctagg tgtctggaaa tcccaaccg	11640
acatgcaatc ctgggtcccc ttatcaacgg atgatccagt gatagacagg ctttacctct	11700
catctcacag aggtgttatc gctgacaatc aagcaaatg ggctgtcccg acaacacgaa	11760
cagatgacaa gttgcgaatg gagacatgct tccaacaggc gtgtaagggt aaaatccaag	11820
cactctgcga gaatcccag tgggcacatc tgaaggataa caggattcct tcatacgggg	11880
tcttgtctgt tgatctgagt ctgacagttg agcttaaaat caaaattgct tcgggattcg	11940
ggccattgat cacacacggt tcagggatgg acctatacaa atccaaccac aacaatgtgt	12000
attggctgac tatcccgcca atgaagaacc tagccttagg tgtaatcaac acattggagt	12060
ggataccgag attcaagggt agtccctacc tcttcactgt cccaattaag gaagcaggcg	12120
aagactgcca tgccccaaca tacctacctg cggaggtgga tggatgatgtc aaactcagtt	12180
ccaatctggt gattctacct ggtcaagatc tccaatatgt tttggcaacc tacgatactt	12240
ccagggttga acatgctgtg gtttattacg tttacagccc aagccgctca ttttcttact	12300
tttatccttt taggttgctt ataaaggggg tccccatcga attacaagtg gaatgcttca	12360
catgggacca aaaactctgg tgccgtcact tctgtgtgct tgcggactca gaatctggtg	12420
gacatatcac tcactctggg atggtgggca tgggagtcag ctgcacagtc acccggaag	12480
atggaaccaa tcgcagatag ggctgctagt gaaccaatca catgatgtca cccagacatc	12540
aggcataccc actagtgtga aatagacatc agaattaaga aaaacgtagg gtccaagtgg	12600

ttccccgtta tggactcgct atctgtcaac cagatcttat accctgaagt tcacctagat	12660
agccccgatag ttaccaataa gatagtagcc atcctggagt atgctcgagt ccctcacgct	12720
tacagcctgg aggaccctac actgtgtcag aacatcaagc accgcctaaa aaacggattt	12780
tccaaccaaa tgattataaa caatgtggaa gttgggaatg tcatcaagtc caagcttagg	12840
agttatccgg cccactctca tattccatat ccaaattgta atcaggattt atttaacata	12900
gaagacaaaag agtcaacgag gaagatccgt gaactcctca aaaaggggaa ttcgctgtac	12960
tccaaagtca gtgataaggt tttccaatgc ttaagggaca ctaactcacg gcttggccta	13020
ggctccgaat tgaggaggga catcaaggag aaagttatta acttgggagt ttacatgcac	13080
agctcccagt ggtttgagcc ctttctgttt tggtttacag tcaagactga gatgagggtca	13140
gtgattaaat cacaaacca tacttgccat aggaggagac acacacctgt attcttcact	13200
ggtagttcag ttgagttgct aatctctcgt gaccttgttg ctataatcag taaagagtct	13260
caacatgtat attacctgac atttgaactg gttttgatgt attgtgatgt catagagggg	13320
aggttaatga cagagaccgc tatgactatt gatgctaggt atacagagct tctaggaaga	13380
gtcagataca tgtggaaact gatagatggg ttcttccttg cactcgggaa tccaacttat	13440
caaattgtag ccatgctgga gcctctttca cttgcttacc tgcagctgag ggatataaca	13500
gtagaactca gaggtgcttt ccttaaccac tgctttactg aaatacatga tgttcttgac	13560
caaaacgggt tttctgatga aggtacttat catgagttaa ctgaagctct agattacatt	13620
ttcataactg atgacataca tctgacaggg gagatthttct catthtttcag aagthttcggc	13680
caccccagac ttgaagcagt aacggctgct gaaaatgtta ggaaatacat gaatcagcct	13740
aaagtcattg tgtatgagac tctgatgaaa ggtcatgcc aatthttgtgg aatcataatc	13800
aacggctatc gtgacaggca cggaggcagt tggccaccgc tgaccctccc cctgcatgct	13860
gcagacacaa tccggaatgc tcaagcttca ggtgaagggt taacacatga gcagtgcgtt	13920
gataactgga aatctthttgc tggagtga aatthttgtgct ttatgcctct tagcctggat	13980
agtgatctga caatgtacct aaaggacaag gcacttgctg ctctccaaag ggaatgggat	14040
tcagthttacc cgaaagagtt cctgcgttac gaccctccca agggaaccgg gtcacggagg	14100
ctttagatag thtttcctta tgattcgagc thtgacctat atgatgtgat aatgtatgtt	14160
gtaagtggag cttacctcca tgaccctgag ttcaacctgt cttacagcct gaaagaaaag	14220

gagatcaagg	aaacaggtag	actttttgct	aaaatgactt	acaaaatgag	ggcatgccaa	14280
gtgattgctg	aaaatctaata	ctcaaacggg	attggcaaata	attttaagga	caatgggatg	14340
gccaaggatg	agcacgattt	gactaaggca	ctccacactc	tagctgtctc	aggagtcccc	14400
aaagatctca	aagaaagtca	cagggggggg	ccagtcttaa	aaacctactc	ccgaagccca	14460
gtccacacaa	gtaccaggaa	cgtgagagca	gcaaaagggt	ttatagggtt	ccctcaagta	14520
attcggcagg	accaagacac	tgatcatccg	gagaatatgg	aagcttacga	gacagtcagt	14580
gcatttatca	cgactgatct	caagaagtac	tgcccttaatt	ggagatatga	gaccatcagc	14640
ttgtttgcac	agaggctaaa	tgagatttac	ggattgccct	cattttttcca	gtggctgcat	14700
aagaggcttg	agacctctgt	cctgtatgta	agtgaccctc	attgcccccc	cgaccttgac	14760
gcccataatcc	cgttatataa	agtccccaat	gatcaaatact	tcattaagta	ccctatggga	14820
ggtatagaag	ggtattgtca	gaagctgtgg	accatcagca	ccattcccta	tctataacctg	14880
gctgcttatg	agagcggagt	aaggattgct	tcgttagtgc	aaggggacaa	tcagaccata	14940
gccgtaacaa	aaaggggtacc	cagcacatgg	ccctacaacc	ttaagaaacg	ggaagctgct	15000
agagtaacta	gagattactt	tgtaattctt	aggcaaaggc	tacatgatata	tggccatcac	15060
ctcaaggcaa	atgagacaat	tgtttcatca	catttttttg	tctattcaaa	aggaatatata	15120
tatgatgggc	tacttgtgtc	ccaatcactc	aagagcatcg	caagatgtgt	attcttgtca	15180
gagactatag	ttgatgaaac	aagggcagca	tgtagtaata	ttgctacaac	aatggctaaa	15240
agcatcgaga	gaggttatga	ccgttacctt	gcatattccc	tgaacgtcct	aaaagtgata	15300
cagcaaattc	tgatctctct	tggtttcaca	atcaattcaa	ccatgaccgc	ggatgtagtc	15360
ataccccctcc	tcacaaacaa	cgacctctta	ataaggatgg	cactgttgcc	cgctcctatt	15420
gggggggatga	attatctgaa	tatgagcagg	ctgtttgtca	gaaacatcgg	tgatccagta	15480
acatcatcaa	ttgctgatct	caagagaatg	attctcgcct	cactaatgcc	tgaagagacc	15540
ctccatcaag	taatgacaca	acaaccgggg	gactcttcat	tcctagactg	ggctagcgac	15600
ccttactcag	caaatcttgt	atgtgtccag	agcatcacta	gactcctcaa	gaacataact	15660
gcaaggtttg	tcctgatcca	tagtccaaac	ccaatgttaa	aaggattatt	ccatgatgac	15720
agtaaagaag	aggacgaggg	actggcggca	ttcctcatgg	acaggcatat	tatagtacct	15780
agggcagctc	atgaaatcct	ggatcatagt	gtcacagggg	caagagagtc	tattgcaggc	15840

atgctggata ccacaaaagg cttgattcga gccagcatga ggaagggggg gttaacctct	15900
cgagtgataa ccagattgtc caattatgac tatgaacaat tcagagcagg gatggtgcta	15960
ttgacaggaa gaaagagaaa tgtcctcatt gacaaagagt catgttcagt gcagctggcg	16020
agagctctaa gaagccatat gtgggcgagg ctagctcgag gacggcctat ttacggcctt	16080
gaggtccctg atgtactaga atctatgcga ggccacctta ttcggcgtca tgagacatgt	16140
gtcatctgcg agtgtggatc agtcaactac ggatggtttt ttgtcccctc gggttgccaa	16200
ctggatgata ttgacaagga aacatcatcc ttgagagtcc catatatagg ttctaccact	16260
gatgagagaa cagacatgaa gcttgccttc gtaagagccc caagtcgatc cttgcgatct	16320
gctgttagaa tagcaacagt gtactcatgg gcttacgggtg atgatgatag ctcttggaa	16380
gaagcctggg tgttggctag gcaaagggcc aatgtgagcc tggaggagct aagggtgatc	16440
actcccatct caacttcgac taatttagcg cataggttga gggatcgtag cactcaagtg	16500
aaatactcag gtacatccct tgtccgagtg gcgaggtata ccacaatctc caacgacaat	16560
ctctcatttg tcatatcaga taagaagggt gatactaact ttatatacca acaaggaatg	16620
cttctagggt tgggtgtttt agaaacattg tttcgactcg agaaagatac cggatcatct	16680
aacacgggat tacatcttca cgtcgaaaca gattgttgcg tgatcccgat gatagatcat	16740
cccaggatac ccagctcccg caagctagag ctgagggcag agctatgtac caaccattg	16800
atatatgata atgcacctt aattgacaga gatgcaaca ggctatacac ccagagccat	16860
aggaggcacc ttgtggaatt tgttacatgg tccacacccc aactatatca ctttttagct	16920
aagtccacag cactatctat gattgacctg gtaacaaaat ttgagaagga ccatatgaat	16980
gaaatttcag ctctcatagg ggatgacgat atcaatagtt tcataactga gtttctgctc	17040
atagagccaa gattattcac tatctacttg ggccagtgtg cgccatcaa ttgggcattt	17100
gatgtacatt atcatagacc atcagggaat tatcagatgg gtgagctgtt gtcacgttc	17160
ctttctagaa tgagcaaagg agtgtttaag gtgcttgtca atgctctaag ccacccaaag	17220
atctacaaga aattctggca ttgtggtatt atagagccta tccatgggtc ttactttagt	17280
gctcaaaact tgcacacaac tgtgtgcaac atggttttaca catgctatat gacctacctc	17340
gacctgttgt tgaatgaaga gttagaagag ttcacatttc tcttgtgtga aagcgacgag	17400
gatgtagtac cggacagatt cgacaacatc caggcaaaac acttatgtgt tctggcagat	17460

ttgtactgtc aaccagggac ctgcccacca attcgaggtc taagaccggt agagaaatgt	17520
gcagttctaa ccgaccatat caaggcagag gctatgttat ctccagcagg atcttcgtgg	17580
aacataaatc caattattgt agaccattac tcatgtcttc tgacttatct ccggcgagga	17640
tcgatcaaac agataagatt gagagttgat ccaggattca ttttcgacgc cctcgctgag	17700
gtaaatgtca gtcagccaaa gatcggcagc aacaacatct caaatatgag catcaaggct	17760
ttcagacccc cacacgatga tgttgcaaaa ttgctcaaag atatcaacac aagcaagcac	17820
aatcttcca tttcaggggg caatctcgcc aattatgaaa tccatgcttt ccgcagaatc	17880
gggttgaact catctgcttg ctacaaagct gttgagatat caacattaat taggagatgc	17940
cttgagccag gggaggacgg cttgttcttg ggtgagggat cgggttctat gttgatcact	18000
tataaagaga tacttaaact aaacaagtgc ttctataata gtgggggtttc cgccaattct	18060
agatctggtc aaaggggaatt agcacctat ccctccgaag ttggccttgt cgaacacaga	18120
atgggagtag gtaatatgtt caaagtgtc tttaacggga ggcccgaagt cacgtgggta	18180
ggcagtgtag attgcttcaa tttcatagtt agtaatatcc ctaccttag tgtgggggtt	18240
atccattcag atatagagac cttgcctgac aaagatacta tagagaagct agaggaattg	18300
gcagccatct tatcgatggc tctgctcctg ggcaaaatag gatcaatact ggtgattaag	18360
cttatgcctt tcagcgggga ttttgttcag ggatttataa gttatgtagg gtctcattat	18420
agagaagtga accttgata ccctagatac agcaacttca tctctactga atcttatttg	18480
gttatgacag atctcaaggc taaccggcta atgaatcctg aaaagattaa gcagcagata	18540
attgaatcat ctgtgaggac ttcacctgga cttataggtc acatcctatc cattaagcaa	18600
ctaagctgca tacaagcaat tgtgggagac gcagttagta gaggtgatat caatcctact	18660
ctgaaaaaac ttacacctat agagcaggtg ctgatcaatt gcgggttggc aattaacgga	18720
cctaagctgt gcaaagaatt gatccacat gatgttgctt cagggaaga tggattgctt	18780
aattctatac tcatcctcta caggagttg gcaagattca aagacaacca aagaagtcaa	18840
caagggatgt tccacgctta ccccgatttg gtaagtagca ggcaacgaga acttatatct	18900
aggatcaccg gcaaattctg ggggcacatt cttctttact ccgggaacaa aaagttgata	18960
aataagttta tccagaatct caagtccggc tatctgatac tagacttaca ccagaatatc	19020
ttcgtaaga atctatccaa gtcagagaaa cagattatta tgacgggggg tttgaaacgt	19080

gagtggggttt ttaaggtaac agtcaaggag accaaagaat ggtataagtt agtcggatac	19140
agtgccctga ttaaggacta attggttgaa ctccggaacc ctaatcctgc cctaggtggt	19200
taggcattat ttgcaatata ttaaagaaaa ctttgaaaat acgaagtttc tattcccagc	19260
tttgtctggt ggccggcatg gtcccagcct cctcgctggc gccggctggg caacattccg	19320
aggggaccgt cccctcggtat atggcgaatg ggacgcggcc gatccggctg ctaacaaagc	19380
ccgaaaggaa gctgagttgg ctgctgccac cgctgagcaa taactagcat aacccttgg	19440
ggcctctaaa cgggtcttga ggggtttttt gctgaaagga ggaactatat ccgatgcgg	19500
ccgcggggccc tatggtaccc agcttttgtt ccctttagtg agggttaatt ccgagcttgg	19560
cgtaatcatg gtcatactg tttcctgtgt gaaattgtta tccgctcaca attccacaca	19620
acataggagc cggaagcata aagtgtaaag cctgggggtgc ctaatgagtg aggttaactca	19680
cattaattgc gttgcgctca ctgcccgtt tccagtcggg aaacctgtcg tgccagctgc	19740
attaatgaat cggccaacgc gcggggagag gcggtttgctg tattgggcgc tcttccgctt	19800
cctcgctcac tgactcgctg cgctcggtcg ttccgctgctg gcgagcggta tcagctcact	19860
caaaggcgggt aatacggtta tccacagaat caggggataa cgcaggaaaag aacatgtgag	19920
caaaaggcca gcaaaaggcc aggaaccgta aaaaggccgc gttgctggcg tttttccata	19980
ggctcggccc ccctgacgag catcacaaaa atcgacgctc aagtcagagg tggcgaaacc	20040
cgacaggact ataaagatac caggcgttcc cccctggaag ctccctcgtg cgctctcctg	20100
ttccgaccct gccgcttacc ggatacctgt ccgcctttct cccttcggga agcgtggcgc	20160
tttctcaatg ctacagctgt aggtatctca gttcgggtgta ggtcgttcgc tccaagctgg	20220
gctgtgtgca cgaaccccc gttcagcccc accgctgcgc cttatccggt aactatcgtc	20280
ttgagtccaa cccggtgaaga cacgacttat cgccactggc agcagccact ggtaacagga	20340
ttagcagagc gaggtatgta ggcgggtgcta cagagttctt gaagtgggtg cctaactacg	20400
gctacactag aaggacagta tttggtatct gcgctctgct gaagccagtt accttcggaa	20460
aaagagttgg tagctcttga tccggcaaac aaaccaccgc tggtagcggg ggtttttttg	20520
tttgcaagca gcagattacg cgcagaaaaa aaggatctca agaagatcct ttgatctttt	20580
ctacgggggtc tgacgctcag tggaacgaaa actcacgtta agggattttg gtcattgagat	20640
tatcaaaaag gatcttcacc tagatccttt taaattaaaa atgaagtttt aaatcaatct	20700

aaagtatata tgagtaaact tggctctgaca gttaccaatg cttaatcagt gaggcaccta	20760
tctcagcgat ctgtctatatt cgttcatcca tagttgcctg actgcccgtc gtgtagataa	20820
ctacgatacg ggagggccta ccatctggcc ccagtgtgc aatgataccg cgagaccac	20880
gctcaccggc tccagattta tcagcaataa accagccagc cggaagggcc gagcgcagaa	20940
gtggtcctgc aactttatcc gcctccatcc agtctattaa ttgttgccgg gaagctagag	21000
taagtagttc gccagttaat agtttgcgca acgttgttgc cattgctaca ggcacgtgg	21060
gtgcacgctc gtcgtttggg atggcttcat tcagctccgg ttccaacga tcaaggcgag	21120
ttacatgatc ccccatgttg tgaaaaaag cggttagctc cttcggtcct ccgatcgttg	21180
tcagaagtaa gttggccgca gtgttatcac tcatgcttat ggcagcactg cataattctc	21240
ttactgtcat gccatccgta agatgctttt ctgtgactgg tgagtactca accaagtcac	21300
tctgagaata gtgtatgcgg cgaccgagtt gctcttgccc ggcgtcaata cgggataata	21360
ccgcgccaca tagcagaact ttaaaagtgc tcatcattgg aaaacgttct tcggggcgaa	21420
aactctcaag gatcttaccg ctgttgagat ccagttcgat gtaaccact cgtgcaccca	21480
actgatcttc agcatctttt actttcacca gcgtttctgg gtgagcaaaa acaggaaggc	21540
aaaatgccgc aaaaaaggga ataaggcgca cacggaaatg ttgaatactc atactcttcc	21600
tttttcaata ttattgaagc atttatcagg gttattgtct catgagcgga tacatatttg	21660
aatgtattta gaaaaataaa caaatagggg ttccgcgcac atttccccga aaagtccac	21720
ctgaaattgt aaacgttaat attttgtaa aattcgcgtt aaatttttgt taaatcagct	21780
cattttttta ccaataggcc gaaatcggca aaatccctta taaatcaaaa gaatagaccg	21840
agataggggt gagtggtgtt ccagtttggg acaagagtcc actattaaag aacgtggact	21900
ccaacgtcaa agggcgaaaa accgtctatc agggcgatgg ccactacgt gaaccatcac	21960
cctaataaag ttttttgggg tcgaggtgcc gtaaagcact aaatcggaac cctaaaggga	22020
gccccgatt tagagcttga cggggaaagc cggcgaacgt ggcgagaaaag gaagggaaga	22080
aagcgaaagg agcgggcgct agggcgctgg caagtgtagc ggtcacgctg cgcgtaacca	22140
ccacacccgc cgcgcttaat gcgccgtac agggcgcgct ccattcgcca ttcaggctgc	22200
gcaactgttg ggaaggcgca tcggtgcggg cctcttcgct attacgccag ccaccgcggt	22260
g	22261

<210> 143
 <211> 22363
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Complete optimised nucleotide sequence of the polynucleotide
 encoding pTM-MVDVax10

 <220>
 <221> misc_feature
 <222> (1)..(8)
 <223> NotI

 <220>
 <221> misc_feature
 <222> (9)..(28)
 <223> T7 promoter

 <220>
 <221> misc_feature
 <222> (29)..(82)
 <223> Hammerhead ribozyme

 <220>
 <221> misc_feature
 <222> (83)..(189)
 <223> MV Leader and N promoter

 <220>
 <221> misc_feature
 <222> (190)..(1767)
 <223> MV N ORF

 <220>
 <221> misc_feature
 <222> (1768)..(1888)
 <223> MV N-P intergenic

 <220>
 <221> misc_feature
 <222> (1889)..(3412)
 <223> MV P ORF

 <220>
 <221> misc_feature
 <222> (3413)..(3531)
 <223> MV ATU2

 <220>
 <221> misc_feature
 <222> (3532)..(5154)

<223> DENV1 NS polyepitope

<220>

<221> misc_feature

<222> (5155)..(5253)

<223> MV P-M intergenic

<220>

<221> misc_feature

<222> (5254)..(6261)

<223> MV M ORF

<220>

<221> misc_feature

<222> (6262)..(7264)

<223> MV M-F intergenic

<220>

<221> misc_feature

<222> (7265)..(8926)

<223> MV F ORF

<220>

<221> misc_feature

<222> (8927)..(9086)

<223> MV-F-H intergenic

<220>

<221> misc_feature

<222> (9087)..(10940)

<223> MV H ORF

<220>

<221> misc_feature

<222> (10941)..(11067)

<223> MV ATU3

<220>

<221> misc_feature

<222> (11068)..(12618)

<223> DENV tetra EDIII + ectoM

<220>

<221> misc_feature

<222> (12619)..(12711)

<223> MV H-L intergenic

<220>

<221> misc_feature

<222> (12712)..(19263)

<223> MV L ORF

<220>

<221> misc_feature

<222> (19264)..(19372)
<223> MV Trailer

<220>
<221> misc_feature
<222> (19373)..(19456)
<223> HDV ribozyme

<220>
<221> misc_feature
<222> (19457)..(19598)
<223> T7 terminator

<220>
<221> misc_feature
<222> (19599)..(19606)
<223> Not I

<220>
<221> misc_feature
<222> (19607)..(122363)
<223> pTM plasmid

<400> 143
gcggccgcta atacgactca ctatagggcc aactttgttt ggtctgatga gtccgtgagg 60
acgaaacccg gagtcccggg tcaccaaaca aagttgggta aggatagttc aatcaatgat 120
catcttctag tgcacttagg attcaagatc ctattatcag ggacaagagc aggattaggg 180
atatccgaga tggccacact ttttaaggagc ttagcattgt tcaaaagaaa caaggacaaa 240
ccaccatta catcaggatc cgggtggagcc atcagaggaa tcaaacacat tattatagta 300
ccaatccctg gagattcctc aattaccact cgatccagac ttctggaccg gttggtgagg 360
ttaattggaa acccggatgt gagcggggccc aaactaacag gggcactaat aggtatatta 420
tccttatttg tggagtctcc aggtcaattg attcagagga tcaccgatga ccctgacgtt 480
agcataaggc tgttagaggt tgtccagagt gaccagtcac aatctggcct taccttcgca 540
tcaagaggta ccaacatgga ggatgaggcg gaccaatact tttcacatga tgatccaatt 600
agtagtgatc aatccaggtt cggatgggtc gggaacaagg aaatctcaga tattgaagtg 660
caagaccctg agggattcaa catgattctg ggtaccatcc tagcccaaatt ttgggtcttg 720
ctcgcaaagg cggttacggc cccagacacg gcagctgatt cggagctaag aaggtggata 780
aagtacacc aacaaagaag ggtagttggg gaatttagat tggagagaaa atggttggat 840
tggtgagga acaggattgc cgaggacctc tccttacgcc gattcatggt cgctctaadc 900

ctggatatca agagaacacc cggaaacaaa cccaggattg ctgaaatgat atgtgacatt	960
gatacatata tcgtagaggc aggattagcc agttttatcc tgactattaa gtttgggata	1020
gaaactatgt atcctgctct tggactgcat gaatttgctg gtgagttatc cacacttgag	1080
tccttgatga acctttacca gcaaattgggg gaaactgcac cctacatggt aatcctggag	1140
aactcaattc agaacaagtt cagtgcagga tcataccctc tgctctggag ctatgccatg	1200
ggagtaggag tggaacttga aaactccatg ggaggtttga actttggccg atcttacttt	1260
gatccagcat attttagatt agggcaagag atggtaagga ggtcagctgg aaaggtcagt	1320
tccacattgg catctgaact cggtatcact gccgaggatg caaggcttgt ttcagagatt	1380
gcaatgcata ctactgagga caagatcagt agagcggttg gaccagaca agcccaagta	1440
tcattttctac acggtgatca aagtgagaat gagctaccga gattgggggg caaggaagat	1500
aggaggggtca aacagagtcg aggagaagcc agggagagct acagagaaac cgggcccagc	1560
agagcaagtg atgcgagagc tgcccatctt ccaaccggca caccctaga cattgacact	1620
gcaacggagt ccagccaaga tccgcaggac agtcgaaggt cagctgacgc cctgcttagg	1680
ctgcaagcca tggcaggaat ctcggaagaa caaggctcag acacggacac ccctatagtg	1740
tacaatgaca gaaatcttct agactaggtg cgagaggccg agggccagaa caacatccgc	1800
ctaccatcca tcattgttat aaaaaactta ggaaccaggt ccacacagcc gccagcccat	1860
caaccatcca ctcccacgat tggagccaat ggcagaagag caggcacgcc atgtcaaaaa	1920
cggactggaa tgcatccggg ctctcaaggc cgagcccata ggctcactgg ccatcgagga	1980
agctatggca gcatggtcag aaatatcaga caaccagga caggagcgag ccacctgcag	2040
ggaagagaag gcaggcagtt cgggtctcag caaacatgc ctctcagcaa ttggatcaac	2100
tgaaggcggg gcacctcgca tccgcgggtc gggacctgga gagagcgatg acgacgtga	2160
aactttggga atcccccaa gaaatctcca ggcataagc actgggttac agtgttatta	2220
cgtttatgat cacagcgggtg aagcggttaa gggaatccaa gatgctgact ctatcatggt	2280
tcaatcaggc cttgatgggtg atagcacctc ctcaggagga gacaatgaat ctgaaaacag	2340
cgatgtggat attggcgaac ctgataccga gggatatgct atcactgacc ggggatctgc	2400
tcccatctct atggggttca gggcttctga tgttgaaact gcagaaggag gggagatcca	2460
cgagctcctg agactccaat ccagaggcaa caactttccg aagcttggga aaactctcaa	2520

tgttcctccg cccccggacc ccggtagggc cagcacttcc gggacacca ttaaaaagg	2580
cacagacgcg agattagcct ctttggaaac ggagatcgcg tctttattga caggtggtgc	2640
aaccaatgt gtcgaaagt caccctcgga accatcaggg ccaggtgcac ctgcggggaa	2700
tgtccccgag tgtgtgagca atgccgcact gatacaggag tggacacccg aatctggtac	2760
cacaatctcc ccgagatccc agaataatga agaaggggga gactattatg atgatgagct	2820
gttctctgat gtccaagata ttaaaacagc cttggccaaa atacacgagg ataatcagaa	2880
gataatctcc aagctagaat cactgctgtt attgaaggga gaagttgagt caattaagaa	2940
gcagatcaac aggcaaaata tcagcatatc caccctggaa ggacacctct caagcatcat	3000
gatcgccatt cctggacttg ggaaggatcc caacgacccc actgcagatg tcgaaatcaa	3060
tcccgacttg aaacccatca taggcagaga ttcaggccga gcactggccg aagttctcaa	3120
gaaacccgtt gccagccgac aactccaagg aatgacaaat ggacggacca gttccagagg	3180
acagctgctg aaggaatttc agctaaagcc gatcgggaaa aagatgagct cagccgtcgg	3240
gtttgttcct gacaccggcc ctgcatcacg cagtgtaatc cgctccatta taaaatccag	3300
ccggctagag gaggatcgga agcgttacct gatgactctc cttgatgata tcaaaggagc	3360
caatgatctt gccaaagtcc accagatgct gatgaagata ataatgaagt agctacagct	3420
caacttacct gccaacccca tgccagtcga cccaactagc ctaccctcca tcattgttat	3480
aaaaaactta ggaaccaggt ccacacagcc gccagcccat caacgcgtac gatggcatca	3540
caggagggac cactgcccga aattgaggac gaagtgttta gaaagcgaaa tctgactatt	3600
atggacctgc accccggatc tggcaagacc cggagatacc tgccagccat cgtgagggag	3660
gctattaagc ggaaactgag aacactgatc ctggccccaa ctcgcgtggt cgcttccgaa	3720
atggctgagg ccctgaaagg catgcccata cggtatcaga ccacagcagt gaagtctgaa	3780
cataccggca aggagattgt ggacctgatg tgccacgcca ctttcacat gcgactgctg	3840
agcccagtgc ggggtcccaa ctacaatatg atcattatgg acgaggccca ctttactgat	3900
cccagctcca tcgccgctag aggatatatt tccaccaggg tgggaatggg cgaggcagca	3960
gctatcttca tgacagcaac tccccctggc agcgtggagg catttcctca gtccaacgcc	4020
gtcatccagg acgaggagcg ggacattcct gagcggagct ggaattctgg gtacgaatgg	4080
atcacagacg aggatcatgc aactggact gaagccaaga tgctgctgga caacattaat	4140

actcctgagg	gaatcattcc	agctctgttc	gagcccgaaa	gagagaagtc	tgacagccatc	4200
gacggcgagt	atagactgag	gggagaggcc	cggaagacct	tcgtggaact	gatgaggcg	4260
ggcgatctgc	ccgtgtggct	gagttacaag	gtcgcttcag	agggattcca	gtatagtgc	4320
cgacggtggt	gctttgatgg	cgaacgcaac	aatcagggtgc	tggaggagaa	catggatgtc	4380
gagatttga	caaaggaagg	cgagcggaag	aaactgcgcc	cacgatggct	ggacgctcgg	4440
acttacagcg	atcccctggc	actgagagaa	ttcaaagagt	ttgctgcagg	ggtggccgtc	4500
gagaatcacc	atcacgccgc	tatgctggac	gtggatctgc	atcctgccag	tgcttggacc	4560
ctgtatgcag	tggccactac	catcattacc	ccaatgatgc	gccacacaat	cgagaacaca	4620
actgccaata	tctcactgac	agctattgca	aaccaggcag	ccattctgat	gggactggac	4680
aaaggctggc	ccatcagcaa	gatggatatt	ggcgtgcctc	tgctggccct	ggggtgttac	4740
agtcagggtgc	tggacatcat	tggccagagg	atcgagaaca	ttaagcatga	gcacaaatca	4800
acctggcatt	acgacgaaga	taatccctat	aagacatggg	cctaccacgg	aagctatgag	4860
gtgaaacctt	caggcagcgc	cagcagcatg	gtcaacgggg	tgggtcaagct	gctgacaaaa	4920
ccttgggacg	tgatcccaat	ggtcactcag	attgccatga	ccgataccac	cccattcggc	4980
cagcagcggg	tgttcaagga	gaagggtggac	acccgcacac	ctaaggctaa	acgaggggact	5040
gcacagatca	tggagggtgac	cgccaagtgg	ctgtggggat	tcctgtccag	gaacaagaag	5100
ccaagaatct	gtaccaggga	agagttcaca	agaaagggtcc	ggtcaaacgc	ctaatgagcg	5160
cgcagcgctt	agacgtctcg	cgatcgatac	tagtacaacc	taaatccatt	ataaaaaact	5220
taggagcaaa	gtgattgcct	cccaagggtcc	acaatgacag	agacctacga	cttcgacaag	5280
tcggcatggg	acatcaaagg	gtcgatcgct	ccgatacaac	ccaccaccta	cagtgatggc	5340
aggctgggtgc	cccagggtcag	agtcatagat	cctgggtctag	gcgacaggaa	ggatgaatgc	5400
tttatgtaca	tgtttctgct	gggggttggt	gaggacagcg	attccctagg	gcctccaatc	5460
gggcgagcat	ttgggttcct	gcccttaggt	gttggcagat	ccacagcaaa	gcccgaaaaa	5520
ctcctcaaag	aggccactga	gcttgacata	gttggttagac	gtacagcagg	gctcaatgaa	5580
aaactgggtgt	tctacaacaa	cacccacta	actctcctca	caccttggag	aaaggtccta	5640
acaacaggga	gtgtcttcaa	cgcaaaccaa	gtgtgcaatg	cggttaatct	gataaccgctc	5700
gataccccgc	agaggttccg	tgttgtttat	atgagcatca	cccgtctttc	ggataacggg	5760

tattacaccg	ttcctagaag	aatgctggaa	ttcagatcgg	tcaatgcagt	ggccttcaac	5820
ctgctggtga	cccttaggat	tgacaaggcg	ataggccctg	ggaagatcat	cgacaataca	5880
gagcaacttc	ctgaggcaac	atttatggtc	cacatcggga	acttcaggag	aaagaagagt	5940
gaagtctact	ctgccgatta	ttgcaaaatg	aaaatcgaaa	agatgggcct	ggtttttgca	6000
cttgggtggga	tagggggcac	cagtcttcac	attagaagca	caggcaaaat	gagcaagact	6060
ctccatgcac	aactcgggtt	caagaagacc	ttatgttacc	cgctgatgga	tatcaatgaa	6120
gaccttaatc	gattactctg	gaggagcaga	tgcaagatag	taagaatcca	ggcagttttg	6180
cagccatcag	ttcctcaaga	attccgcatt	tacgacgacg	tgatcataaa	tgatgaccaa	6240
ggactattca	aagttctgta	gaccgtagtg	cccagcaatg	cccgaaaacg	acccccctca	6300
caatgacagc	cagaaggccc	ggacaaaaaa	gccccctccg	aaagactcca	cggaccaagc	6360
gagaggccag	ccagcagccg	acggcaagcg	cgaacaccag	gcggccccag	cacagaacag	6420
ccctgacaca	aggccaccac	cagccacccc	aatctgcatc	ctcctcgtgg	gacccccgag	6480
gaccaacccc	caaggctgcc	cccgatccaa	accaccaacc	gcatccccac	cacccccggg	6540
aaagaaaccc	ccagcaattg	gaaggcccct	ccccctcttc	ctcaacacaa	gaactccaca	6600
accgaaccgc	acaagcgacc	gaggtgaccc	aaccgcaggc	atccgactcc	ctagacagat	6660
cctctctccc	cggcaaaacta	aacaaaactt	agggccaaagg	aacatacaca	cccaacagaa	6720
cccagacccc	ggcccacggc	gccgcgcccc	caacccccga	caaccagagg	gagcccccaa	6780
ccaatcccg	cggctcccc	ggtgcccaca	ggcagggaca	ccaacccccg	aacagaccca	6840
gcaccaacc	atcgacaatc	caagacgggg	gggccccccc	aaaaaaaggc	ccccaggggc	6900
cgacagccag	caccgcgagg	aagcccaccc	acccacaca	cgaccacggc	aaccaaacca	6960
gaaccagac	caccctgggc	caccagctcc	cagactcggc	catcaccccg	cagaaaggaa	7020
aggccacaac	ccgcgcaccc	cagccccgat	ccggcgggga	gccaccaaac	ccgaaccagc	7080
accaagagc	gatccccgaa	ggacccccga	accgcaaagg	acatcagtat	cccacagcct	7140
ctccaagtcc	cccggctctc	tcctcttctc	gaagggacca	aaagatcaat	ccaccacacc	7200
cgacgacact	caactcccca	cccctaaagg	agacaccggg	aatcccagaa	tcaagactca	7260
tccaatgtcc	atcatgggtc	tcaaggtgaa	cgtctctgcc	atattcatgg	cagtactgtt	7320
aactctccaa	acaccaccg	gtcaaatcca	ttggggcaat	ctctctaaga	taggggtggt	7380

aggaatagga agtgcaagct acaaagttat gactcgttcc agccatcaat cattagtc	7440
aaaattaatg cccaatataa ctctcctcaa taactgcacg agggtagaga ttgcagaata	7500
caggagacta ctgagaacag ttttggaacc aattagagat gcacttaatg caatgaccca	7560
gaatataaga ccggttcaga gtgtagcttc aagtaggaga cacaagagat ttgcgggagt	7620
agtcctggca ggtgcggccc taggcgttgc cacagctgct cagataacag ccggcattgc	7680
acttcaccag tccatgctga actctcaagc catcgacaat ctgagagcga gcctggaaac	7740
tactaatcag gcaattgaga caatcagaca agcagggcag gagatgatat tggctgttca	7800
gggtgtccaa gactacatca ataatgagct gataccgtct atgaaccaac tatcttgtga	7860
tttaatcggc cagaagctcg ggctcaaatt gctcagatac tatacagaaa tcctgtcatt	7920
atttggcccc agtttacggg accccatatc tgcggagata tctatccagg ctttgagcta	7980
tgcgcttgga ggagacatca ataaggtgtt agaaaagctc ggatacagtg gaggtgattt	8040
actgggcatc ttagagagcg gaggaataaa ggcccggata actcacgtcg acacagagtc	8100
ctacttcatt gtcctcagta tagcctatcc gacgctgtcc gagattaagg gggtgattgt	8160
ccaccggcta gaggggggtct cgtacaacat aggctctcaa gagtggtata ccactgtgcc	8220
caagtatgtt gcaaccaag ggtaccttat ctcgaatttt gatgagtcac cgtgtacttt	8280
catgccagag gggactgtgt gcagccaaaa tgccttgtac ccgatgagtc ctctgctcca	8340
agaatgcctc cgggggtaca ccaagtcctg tgctcgtaca ctcgtatccg ggtcttttgg	8400
gaaccggttc attttatcac aagggaacct aatagccaat tgtgcatcaa tcctttgcaa	8460
gtgttacaca acaggaacga tcattaatca agaccctgac aagatcctaa catacattgc	8520
tgccgatcac tgcccggtag tcgaggtgaa cggcgtgacc atccaagtcg ggagcaggag	8580
gtatccagac gctgtgtact tgcacagaat tgacctcggc cctcccatat cattggagag	8640
gttggaacgta gggacaaatc tggggaatgc aattgctaag ttggaggatg ccaaggaatt	8700
gttggaacgta tcggaccaga tattgaggag tatgaaaggt ttatcgagca ctagcatagt	8760
ctacatcctg attgcagtgt gtcttggagg gttgataggg atccccgctt taatatgttg	8820
ctgcaggggg cgttgtaaca aaaagggaga acaagttggc atgtcaagac caggcctaaa	8880
gcctgatctt acgggaacat caaaatccta tgtaaggtcg ctctgatcct ctacaactct	8940
tgaacacaaa atgtcccaca agtctcctct tcgtcatcaa gcaaccaccg caccagcat	9000

caagcccacc	tgaaattatc	tccggcttcc	ctctggccga	acaatatcgg	tagttaatca	9060
aaacttaggg	tgcaagatca	tccacaatgt	caccacaacg	agaccggata	aatgccttct	9120
acaaagataa	cccccatccc	aagggaagta	ggatagtcac	taacagagaa	catcttatga	9180
ttgatagacc	ttatgttttg	ctggctgttc	tgtttgtcat	gtttctgagc	ttgatcgggt	9240
tgctagccat	tgcaaggcatt	agacttcac	gggcagccat	ctacaccgca	gagatccata	9300
aaagcctcag	caccaatcta	gatgtaacta	actcaatcga	gcatcaggtc	aaggacgtgc	9360
tgacaccact	cttcaaaatc	atcgggtgatg	aagtgggcct	gaggacacct	cagagattca	9420
ctgacctagt	gaaattaatc	tctgacaaga	ttaaattcct	taatccggat	agggagtagc	9480
acttcagaga	tctcacttgg	tgtatcaacc	cgccagagag	aatcaaattg	gattatgatc	9540
aatactgtgc	agatgtggct	gctgaagagc	tcatgaatgc	attggtgaac	tcaactctac	9600
tggagaccag	aacaaccaat	cagttcctag	ctgtctcaaa	gggaaactgc	tcagggccca	9660
ctacaatcag	aggtcaattc	tcaaacatgt	cgctgtccct	gtagacttg	tatttaggtc	9720
gaggttacaa	tgtgtcatct	atagtcacta	tgacatccca	gggaatgtat	gggggaactt	9780
acctagtgga	aaagccta	ctgagcagca	aaaggtcaga	gttgtcacia	ctgagcatgt	9840
accgagtgtt	tgaagtaggt	gttatcagaa	atccgggttt	gggggctccg	gtgttccata	9900
tgacaaaacta	tcttgagcaa	ccagtcagta	atgatctcag	caactgtatg	gtggcttttg	9960
gggagctcaa	actcgagcc	ctttgtcacg	gggaagattc	tatcacaatt	ccctatcagg	10020
gatcaggga	aggtgtcagc	ttccagctcg	tcaagctagg	tgtctggaaa	tcccaaccg	10080
acatgcaatc	ctgggtcccc	ttatcaacgg	atgatccagt	gatagacagg	ctttacctct	10140
catctcacag	aggtgttatc	gctgacaatc	aagcaaatg	ggctgtcccg	acaacacgaa	10200
cagatgacaa	gttgcgatg	gagacatgct	tccaacaggc	gtgtaagggt	aaaatccaag	10260
cactctgcga	gaatcccag	tgggcacat	tgaaggataa	caggattcct	tcatacgggg	10320
tcttgtctgt	tgatctgagt	ctgacagttg	agcttaaaat	caaaattgct	tcgggattcg	10380
ggccattgat	cacacacggt	tcagggatgg	acctatacaa	atccaaccac	aacaatgtgt	10440
attggctgac	tatcccgcca	atgaagaacc	tagccttagg	tgtaatcaac	acattggagt	10500
ggataccgag	attcaagggt	agtccctacc	tcttcactgt	ccaattaag	gaagcaggcg	10560
aagactgcca	tgccccaaca	tacctacctg	cggaggtgga	tggtgatgtc	aaactcagtt	10620

ccaatctggt gattctacct ggtcaagatc tccaatatgt tttggcaacc tacgatactt	10680
ccagggttga acatgctgtg gtttattacg tttacagccc aagccgctca ttttcttact	10740
tttatccttt taggttgcct ataaaggggg tccccatcga attacaagtg gaatgcttca	10800
catgggacca aaaactctgg tgccgtcact tctgtgtgct tgcggactca gaatctggtg	10860
gacatatcac tcactctggg atggtgggca tgggagtcag ctgcacagtc acccggaag	10920
atggaaccaa tcgcagatag ggctgctagt gaaccaatca catgatgtca cccagacatc	10980
aggcataccc actagtctac cctccatcat tgttataaaa aacttaggaa ccaggtccac	11040
acagccgcca gcccataac gcgtacgatg ggcatacatat tcattcttct tatgctggtt	11100
acaccgtcta tggcggagaa acttcgaatc aaaggtatga gctatacgat gtgcagcggc	11160
aagttcaaga tcgagaagga aatggctgaa acccagcacg gtacaactgt ggtcaaagtc	11220
aaatatgagg gggctggcgc tccctgtaaa gtaccattg agattaggga cgtcaataaa	11280
gagaaggtgg taggtcgcatt catctccagt acacctttgg ccgagaacac gaactccgtc	11340
acaaacatag agttggaacc cccgttcgga gactcataca ttgtgatcgg ggtgggcaac	11400
tctgcactca cactgcattg gttcaagaag ggaagcagta tcggccgcag ggataagaga	11460
gacaaactga aattgaaagg tatgtcctat gccatgtgca cgaatacttt cgttctcaag	11520
aaagaagtat ctgagactca gcacggaacc atcctgatca aagtcgagta caaaggagaa	11580
gacgtgccct gtaagatccc attcagtacc gaggatggac agggcaaggc ccataacggc	11640
agggtgataa ccgccaaccc tgtgggttaca aagaaggaag agccagtcaa tatcgaagct	11700
gagccaccgt tcggggagag caacatagta attggcatag gggataatgc tttgaagatc	11760
aactggtaca agaaaggaag ctccattggc cgaagagata agcgcgacaa actccagctg	11820
aaaggaatga gctactccat gtgtactggg aagttcaaga ttgtcaagga aatcgccgaa	11880
actcagcatg gcactattgt gatccgcgtg cagtatgaag gcgatggtag cccctgcaag	11940
ataccatttg aaatcaccga tttggagaaa cggcacgtcc tgggtcggct cattaccgtg	12000
aaccaatcg tgaccgagaa ggacagtcca gttaatatcg aggccgagcc tcctttcggc	12060
gacagttaca tcattgtagg ggtggaacca gggcaactga agctgaactg gttcaagaaa	12120
ggcagcagta taggacggcg ggataaacgg gacaaactca cactgaaagg catgtcatatc	12180
gttatgtgca ccggctcatt caaactggag aaggaagttg cagagacaca gcatgggacc	12240

gtgctcgtgc aggtcaaata cgagggcacc gacgctcctt gcaagattcc gttcagtaca	12300
caggacgaga aaggcgtgac tcagaacggc agattgatta cagcgaaccc tatcgtgact	12360
gacaaggaga agccagttaa catcgagact gagccgcctt tcggagaatc atacattatc	12420
gtgggagccg gcgagaaggc actgaaactc agctggttca agaagggcag ctcaatcggc	12480
cggagagaca agcggctctgt cgccctcgca ccgcacgtgg gcctgggtct ggaaacgagg	12540
accgagacgt ggatgagttc cgaaggcgca tggaagcaaa tccagaaagt ggagacgtgg	12600
gccctcaggc atccgtaatg agcgcgcagc gcttagacgt ctcgcgatcg atgctagtgt	12660
gaaatagaca tcagaattaa gaaaaacgta gggccaagt ggttccccgt tatggactcg	12720
ctatctgtca accagatctt ataccctgaa gttcacctag atagcccgat agttaccaat	12780
aagatagtag ccatacctgga gtatgctcga gtccctcacg cttacagcct ggaggaccct	12840
acactgtgtc agaacatcaa gcaccgccta aaaaacggat tttccaacca aatgattata	12900
aacaatgtgg aagttgggaa tgtcatcaag tccaagctta ggagttatcc ggcccactct	12960
catattccat atccaaattg taatcaggat ttatttaaca tagaagacaa agagtcaacg	13020
aggaagatcc gtgaactcct caaaaagggg aattcgctgt actccaaagt cagtataag	13080
gttttccaat gcttaaggga cactaactca cggcttgcc taggctccga attgaggag	13140
gacatcaagg agaaagttat taacttggga gtttacatgc acagctcca gtggtttgag	13200
ccctttctgt tttggtttac agtcaagact gagatgaggt cagtgattaa atcacaaacc	13260
catacttgcc ataggaggag acacacacct gtattcttca ctggtagttc agttgagttg	13320
ctaactcttc gtgaccttgt tgctataatc agtaaagagt ctcaacatgt atattacctg	13380
acatttgaac tggttttgat gtatttgtat gtcatagagg ggaggttaat gacagagacc	13440
gctatgacta ttgatgctag gtatacagag cttctaggaa gagtcagata catgtggaaa	13500
ctgatagatg gtttcttccc tgcactcggg aatccaactt atcaaattgt agccatgctg	13560
gagcctcttt cacttgctta cctgcagctg aggatataa cagtagaact cagaggtgct	13620
ttccttaacc actgctttac tgaaatacat gatgttcttg accaaaacgg gttttctgat	13680
gaaggactt atcatgagtt aactgaagct ctagattaca ttttcataac tgatgacata	13740
catctgacag gggagatttt ctcatTTTTTc agaagtttcg gccaccccag acttgaagca	13800
gtaacggctg ctgaaaatgt taggaaatac atgaatcagc ctaaagtcac tgtgtatgag	13860

actctgatga aaggtcatgc catatTTTTgt ggaatcataa tcaacggcta tcgtgacagg	13920
cacggaggca gttggccacc gctgaccctc cccctgcatg ctgcagacac aatccggaat	13980
gctcaagctt caggtgaagg gttaacacat gagcagtgcg ttgataactg gaaatctttt	14040
gctggagtga aatttggctg ctttatgcct cttagcctgg atagtgatct gacaatgtac	14100
ctaaaggaca aggcaattgc tgctctccaa agggaatggg attcagttta cccgaaagag	14160
ttcctgcgtt acgaccctcc caagggaacc gggtcacgga ggcttgtaga tgttttcctt	14220
aatgattcga gctttgacct atatgatgtg ataatgtatg ttgtaagtgg agcttacctc	14280
catgaccctg agttcaacct gtcttacagc ctgaaagaaa aggagatcaa ggaaacaggt	14340
agactttttg ctaaaatgac ttacaaaatg agggcatgcc aagtgattgc tgaaaatcta	14400
atctcaaacg ggattggcaa atattttaag gacaatggga tggccaagga tgagcacgat	14460
ttgactaagg cactccacac tctagctgtc tcaggagtcc ccaaagatct caaagaaagt	14520
cacagggggg ggccagtctt aaaaacctac tcccgaagcc cagtccacac aagtaccagg	14580
aacgtgagag cagcaaaagg gtttataggg ttccctcaag taattcggca ggaccaagac	14640
actgatcatc cggagaatat ggaagcttac gagacagtca gtgcatttat cacgactgat	14700
ctcaagaagt actgccttaa ttggagatat gagaccatca gcttgtttgc acagaggcta	14760
aatgagattt acggattgcc ctcatTTTTc cagtggctgc ataagaggct tgagacctct	14820
gtcctgtatg taagtgacct tcattgcccc cccgacctg acgcccatac cccgttatat	14880
aaagtcccca atgatcaaat cttcattaag taccctatgg gaggtataga agggatttgt	14940
cagaagctgt ggaccatcag caccattccc tatctatacc tggctgctta tgagagcgga	15000
gtaaggattg cttcgttagt gcaaggggac aatcagacca tagccgtaac aaaaagggta	15060
cccagcacat ggccctacaa ccttaagaaa cggaagctg ctagagtaac tagagattac	15120
tttgtaattc ttaggcaaag gctacatgat attggccatc acctcaaggc aaatgagaca	15180
attgtttcat cacatTTTTt tgtctattca aaaggaatat attatgatgg gctacttgtg	15240
tccaatcac tcaagagcat cgcaagatgt gtattctggg cagagactat agttgatgaa	15300
acaagggcag catgcagtaa tattgctaca acaatggcta aaagcatcga gagaggttat	15360
gaccgttacc ttgcatattc cctgaacgtc ctaaaagtga tacagcaaat tctgatctct	15420
cttggcttca caatcaattc aacctgacc cgggatgtag tcatacccct cctcaciaac	15480

aacgacctct taataaggat ggcactgttg cccgctccta ttgggggggat gaattatctg	15540
aatatgagca ggctgtttgt cagaaacatc ggtgatccag taacatcatc aattgctgat	15600
ctcaagagaa tgattctcgc ctactaatg cctgaagaga ccctccatca agtaatgaca	15660
caacaaccgg gggactcttc attcctagac tgggctagcg acccttactc agcaaattctt	15720
gtatgtgtcc agagcatcac tagactcctc aagaacataa ctgcaagggtt tgtcctgatac	15780
catagtccaa acccaatggtt aaaaggatta ttccatgatg acagtaaaga agaggacgag	15840
ggactggcgg cattcctcat ggacaggcat attatagtac ctagggcagc tcatgaaatc	15900
ctggatcata gtgtcacagg ggcaagagag tctattgcag gcatgctgga taccacaaaa	15960
ggcttgattc gagccagcat gaggaagggg ggggttaacct ctcgagtgat aaccagattg	16020
tccaattatg actatgaaca attcagagca gggatgggtgc tattgacagg aagaaagaga	16080
aatgtcctca ttgacaaaga gtcattgttca gtgcagctgg cgagagctct aagaagccat	16140
atgtgggcga ggctagctcg aggacggcct atttacggcc ttgaggtccc tgatgtacta	16200
gaatctatgc gaggccacct tattcggcgt catgagacat gtgtcatctg cgagtgtgga	16260
tcagtcaact acggatgggtt ttttgtcccc tcgggttgcc aactggatga tattgacaag	16320
gaaacatcat ccttgagagt cccatatatt ggttctacca ctgatgagag aacagacatg	16380
aagcttgcct tcgtaagagc cccaagtcga tccttgcgat ctgctgttag aatagcaaca	16440
gtgtactcat gggcttacgg tgatgatgat agctcttgga acgaagcctg gttgttggt	16500
aggcaaaggg ccaatgtgag cctggaggag ctaagggtga tcactcccat ctcaacttcg	16560
actaatttag cgcatagggt gagggatcgt agcactcaag tgaaatactc aggtacatcc	16620
cttgtccgag tggcgaggta taccacaatc tccaacgaca atctctcatt tgtcatatca	16680
gataagaagg ttgatactaa ctttatatac caacaaggaa tgcttctagg gttgggtgtt	16740
ttagaaacat tgtttcgact cgagaaagat accggatcat ctaacacggt attacatctt	16800
cacgtcgaag cagattgttg cgtgatcccg atgatagatc atcccaggat acccagctcc	16860
cgcaagctag agctgagggc agagctatgt accaaccat tgatatatga taatgcacct	16920
ttaattgaca gagatgcaac aaggctatac acccagagcc ataggaggca ctttgtggaa	16980
tttgttacat ggtccacacc ccaactatat cacatttttag ctaagtccac agcactatct	17040
atgattgacc tggttaacaaa atttgagaag gaccatatga atgaaatttc agctctcata	17100

ggggatgacg	atatcaatag	tttcataact	gagtttctgc	tcatagagcc	aagattattc	17160
actatctact	tgggccagtg	tgcggccatc	aattgggcat	ttgatgtaca	ttatcataga	17220
ccatcaggga	aatatcagat	gggtgagctg	ttgtcatcgt	tcctttctag	aatgagcaaa	17280
ggagtgttta	aggtgcttgt	caatgctcta	agccacccaa	agatctacaa	gaaattctgg	17340
catttggtta	ttatagagcc	tatccatggt	ccttcacttg	atgctcaaaa	cttgcacaca	17400
actgtgtgca	acatggttta	cacatgctat	atgacctacc	tcgacctggt	gttgaatgaa	17460
gagttagaag	agttcacatt	tctcttgtgt	gaaagcgacg	aggatgtagt	accggacaga	17520
ttcgacaaca	tccaggcaaa	acacttatgt	gttctggcag	atttgtactg	tcaaccaggg	17580
acctgcccac	caattcgagg	tctaagaccg	gtagagaaat	gtgcagttct	aaccgaccat	17640
atcaaggcag	aggctatggt	atctccagca	ggatcttcgt	ggaacataaa	tccaattatt	17700
gtagaccatt	actcatgctc	tctgacttat	ctccggcgag	gatcgatcaa	acagataaga	17760
ttgagagttg	atccaggatt	cattttcgac	gccctcgctg	aggtaaattgt	cagtcagcca	17820
aagatcggca	gcaacaacat	ctcaaatatg	agcatcaagg	ctttcagacc	cccacacgat	17880
gatgttgcaa	aattgctcaa	agatatcaac	acaagcaagc	acaatcttcc	catttcaggg	17940
ggcaatctcg	ccaattatga	aatccatgct	ttccgcagaa	tcggggttgaa	ctcatctgct	18000
tgctacaaaag	ctgttgagat	atcaacatta	attaggagat	gccttgagcc	aggggaggac	18060
ggcttgttct	tgggtgaggg	atcgggttct	atgttgatca	cttataaaga	gataacttaaa	18120
ctaaacaagt	gcttctataa	tagtgggggt	tccgccaatt	ctagatctgg	tcaaagggaa	18180
ttagcaccct	atccctccga	agttggcctt	gtcgaacaca	gaatgggagt	aggtaatatt	18240
gtcaaagtgc	tctttaacgg	gaggcccgaa	gtcacgtggg	taggcagtgt	agattgcttc	18300
aatttcatag	ttagtaatat	ccctacctct	agtgtgggggt	ttatccattc	agatatagag	18360
acctgacctg	acaaagatac	tatagagaag	ctagaggaat	tggcagccat	cttatcgatg	18420
gctctgctcc	tgggcaaaaat	aggatcaata	ctggtgatta	agcttatgcc	tttcagcggg	18480
gattttgttc	agggatttat	aagttatgta	gggtctcatt	atagagaagt	gaaccttgta	18540
taccctagat	acagcaactt	catctctact	gaatcttatt	tggttatgac	agatctcaag	18600
gctaaccggc	taatgaatcc	tgaaaagatt	aagcagcaga	taattgaatc	atctgtgagg	18660
acttcacctg	gacttatagg	tcacatccta	tccattaagc	aactaagctg	catacaagca	18720

attgtgggag acgcagttag tagaggtgat atcaatccta ctctgaaaaa acttacacct	18780
atagagcagg tgctgatcaa ttgcgggttg gcaattaacg gacctaagct gtgcaaagaa	18840
ttgatccacc atgatgttgc ctgagggcaa gatggattgc ttaattctat actcatcctc	18900
tacagggagt tggcaagatt caaagacaac caaagaagtc aacaagggat gttccacgct	18960
taccccgtat tggtaagtag caggcaacga gaacttatat ctaggatcac ccgcaaattc	19020
tgggggcaca ttcttcttta ctccgggaac aaaaagttga taaataagtt tatccagaat	19080
ctcaagtccg gctatctgat actagactta caccagaata tcttcgttaa gaatctatcc	19140
aagtcagaga aacagattat tatgacgggg ggtttgaaac gtgagtgggt ttttaaggta	19200
acagtcaagg agaccaaaga atggtataag ttagtcggat acagtgccct gattaaggac	19260
taattggttg aactccggaa ccctaatacct gccctaggtg gttaggcatt atttgcaata	19320
tattaaagaa aactttgaaa atacgaagtt tctattccca gctttgtctg gtggccggca	19380
tgggtcccagc ctctcgtcg gcgccggctg ggcaacattc cgaggggacc gtcccctcgg	19440
taatggcgaa tgggacgcgg ccgatccggc tgctaacaaa gcccgaaagg aagctgagtt	19500
ggctgctgcc accgctgagc aataactagc ataaccctt ggggcctcta aacgggtctt	19560
gaggggtttt ttgctgaaag gaggaactat atccggatgc ggccgcgggc cctatggtac	19620
ccagcttttg ttccctttag tgagggttaa ttccgagctt ggcgtaatca tggtcatagc	19680
tgtttcctgt gtgaaattgt tatccgctca caattccaca caacatagga gccggaagca	19740
taaagtgtaa agcctgggggt gcctaatagag tgaggtaact cacattaatt gcgttgcgct	19800
cactgcccgc tttccagtcg ggaaacctgt cgtgccagct gcattaatga atcggccaac	19860
gcgcggggag aggcggtttg cgtattgggc gctcttcgc ttcctcgtc actgactcgc	19920
tgcgctcggg cgttcggctg cggcgagcgg tatcagctca ctcaaaggcg gtaatacggg	19980
tatccacaga atcaggggat aacgcaggaa agaacatgtg agcaaaaggc cagcaaaagg	20040
ccaggaaccg taaaaaggcc gcgttgctgg cgtttttcca taggctcggc cccctgacg	20100
agcatcacia aaatcgacgc tcaagtcaga ggtggcgaaa cccgacagga ctataaagat	20160
accaggcggt cccccctgga agctccctcg tgcgctctcc tgttccgacc ctgccgtta	20220
ccggatacct gtccgccttt ctcccttcgg gaagcgtggc gctttctcaa tgctcacgct	20280
gtaggtatct cagttcgggt taggtcggtt gctccaagct gggctgtgtg cacgaacccc	20340

ccgttcagcc cgaccgctgc gccttatccg gtaactatcg tcttgagtcc aacccggtaa	20400
gacacgactt atcgccactg gcagcagcca ctggtaacag gattagcaga gcgaggatatg	20460
taggcggtgc tacagagttc ttgaagtggg ggcctaacta cggctacact agaaggacag	20520
tatttggtat ctgcgctctg ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt	20580
gatccggcaa acaaaccacc gctggtagcg gtgggtttttt tgtttgcaag cagcagatta	20640
cgcgcagaaa aaaaggatct caagaagatc ctttgatctt ttctacgggg tctgacgctc	20700
agtggaacga aaactcacgt taagggattt tggatcatgag attatcaaaa aggatcttca	20760
cctagatcct tttaaattaa aaatgaagtt ttaaataaat ctaaagtata tatgagtaaa	20820
cttggctctga cagttaccaa tgcttaataca gtgaggcacc tatctcagcg atctgtctat	20880
ttcggtcatc catagttgcc tgactgcccg tcgtgtagat aactacgata cgggagggct	20940
taccatctgg cccagtgct gcaatgatac cgcgagaccc acgctcaccg gctccagatt	21000
tatcagcaat aaaccagcca gccggaaggc cgcgagcgag aagtggtcct gcaactttat	21060
ccgcctccat ccagtctatt aattgttgcc gggaagctag agtaagtagt tcgccagtta	21120
atagtttgcg caacgttggt gccattgcta caggcatcgt ggtgtcacgc tcgtcgtttg	21180
gtatggcttc attcagctcc gggtcccaac gatcaaggcg agttacatga tccccatgt	21240
tgtgaaaaaa agcgggttagc tccttcgggc ctccgatcgt tgtcagaagt aagttggccg	21300
cagtgttatc actcatgctt atggcagcac tgcataattc tcttactgtc atgccatccg	21360
taagatgctt ttctgtgact ggtgagtact caaccaagtc attctgagaa tagtgtatgc	21420
ggcgaccgag ttgctcttgc ccggcgtaaa tacgggataa taccgcgcca catagcagaa	21480
ctttaaaagt gtcattcatt ggaaaacgtt cttcggggcg aaaactctca aggatcttac	21540
cgctgttgag atccagttcg atgtaacca ctcgtgcacc caactgatct tcagcatctt	21600
ttactttcac cagcgtttct gggtgagcaa aaacaggaag gcaaaatgcc gcaaaaaagg	21660
gaataagggc gacacggaaa tggtgaatac tcatactctt cttttttcaa tattattgaa	21720
gcatttatca gggttattgt ctcatgagcg gatacatatt tgaatgtatt tagaaaaata	21780
aacaaatagg ggttcgcgc acatttcccc gaaaagtgcc acctgaaatt gtaaacttta	21840
atattttgtt aaaattcgcg ttaaattttt gttaaatacag ctcatTTTTT aaccaatagg	21900
ccgaaatcgg caaaatccct tataaatcaa aagaatagac cgagataggg ttgagtgttg	21960

ttccagtttg gaacaagagt ccactattaa agaacgtgga ctccaacgtc aaagggcgaa	22020
aaaccgtcta tcagggcgat ggcccactac gtgaaccatc accctaataca agtttttttg	22080
ggtcgaggtg ccgtaaagca ctaaattcgga accctaaagg gagccccga tttagagctt	22140
gacggggaaa gccggcgaac gtggcgagaa aggaaggga gaaagcgaaa ggagcgggcg	22200
ctagggcgct ggcaagtgt gcggtcacgc tgcgcgtaac caccacacc gccgcgtta	22260
atgcgccgct acagggcgcg tcccattcgc cattcaggct gcgcaactgt tgggaagggc	22320
gatcgggtgc ggcctcttcg ctattacgcc agccaccgcg gtg	22363

<210> 144

<211> 1554

<212> DNA

<213> Artificial Sequence

<220>

<223> Nucleotide sequence of the polynucleotide encoding DENV tetra
EDIII-ectoM

<400> 144

atgggcatca tattcattct tcttatgctg gttacaccgt ctatggcgga gaaacttcga	60
atcaaaggta tgagctatac gatgtgcagc ggcaagttca agatcgagaa ggaaatggct	120
gaaaccagc acggtacaac tgttgtcaaa gtcaaataatg agggggctgg cgctccctgt	180
aaagtaccca ttgagattag ggacgtcaat aaagagaagg tggtaggtcg catcatctcc	240
agtacacctt tggccgagaa cacgaactcc gtcacaaaca tagagttgga acccccgttc	300
ggagactcat acatttgtat cgggggtggc aactctgcac tcacactgca ttggttcaag	360
aagggaagca gtatcggccg cagggataag agagacaaac tgaaattgaa aggtatgtcc	420
tatgccatgt gcacgaatac tttcgttctc aagaaagaag tatctgagac tcagcacgga	480
accatcctga tcaaagtcga gtacaaagga gaagacgtgc cctgtaagat ccatttcagt	540
accgaggatg gacagggcaa ggcccataac ggcaggctga taaccgcaa ccctgtggtt	600
acaaagaagg aagagccagt caatatcgaa gctgagccac cgttcgggga gagcaacata	660
gtaattggca taggggataa tgctttgaag atcaactggt acaagaaagg aagctccatt	720
ggccgaagag ataagcgcga caaactccag ctgaaaggaa tgagctactc catgtgtact	780
gggaagtca agattgtcaa ggaaatcgcc gaaactcagc atggcactat tgtgatccgc	840
gtgcagtatg aaggcgatgg tagcccctgc aagataccat ttgaaatcac cgatttggag	900

aaacggcacg tcctgggtcg gctcattacc gtgaacccaa tcgtgaccga gaaggacagt 960
 ccagtttaata tcgaggccga gcctcctttc ggcgacagtt acatcattgt aggggtggaa 1020
 ccagggaac tgaagctgaa ctggttcaag aaaggcagca gtataggacg gcgggataaa 1080
 cgggacaaaac tcacactgaa aggcattgtca tacgttatgt gcaccggctc attcaaactg 1140
 gagaaggaag ttgcagagac acagcatggg accgtgctcg tgcaggtcaa atacgagggc 1200
 accgacgctc cttgcaagat tccgttcagt acacaggacg agaaaggcgt gactcagaac 1260
 ggcagattga ttacagcgaa ccctatcgtg actgacaagg agaagccagt taacatcgag 1320
 actgagccgc ctttcggaga atcatacatt atcgtgggag ccggcgagaa ggcactgaaa 1380
 ctgagctggg tcaagaaggg cagctcaatc ggtcggagag acaagcggtc tgtcgccctc 1440
 gcaccgcacg tgggcctggg tctggaaacg aggaccgaga cgtggatgag ttccgaaggc 1500
 gcatggaagc aaatccagaa agtggagacg tgggccctca ggcattccgta atga 1554

<210> 145
 <211> 516
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Amino acid sequence of DENV tetra EDIII-ectoM

<400> 145

Met Gly Ile Ile Phe Ile Leu Leu Met Leu Val Thr Pro Ser Met Ala
 1 5 10 15

Glu Lys Leu Arg Ile Lys Gly Met Ser Tyr Thr Met Cys Ser Gly Lys
 20 25 30

Phe Lys Ile Glu Lys Glu Met Ala Glu Thr Gln His Gly Thr Thr Val
 35 40 45

Val Lys Val Lys Tyr Glu Gly Ala Gly Ala Pro Cys Lys Val Pro Ile
 50 55 60

Glu Ile Arg Asp Val Asn Lys Glu Lys Val Val Gly Arg Ile Ile Ser
 65 70 75 80

Ser Thr Pro Leu Ala Glu Asn Thr Asn Ser Val Thr Asn Ile Glu Leu
85 90 95

Glu Pro Pro Phe Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Asn Ser
100 105 110

Ala Leu Thr Leu His Trp Phe Lys Lys Gly Ser Ser Ile Gly Arg Arg
115 120 125

Asp Lys Arg Asp Lys Leu Lys Leu Lys Gly Met Ser Tyr Ala Met Cys
130 135 140

Thr Asn Thr Phe Val Leu Lys Lys Glu Val Ser Glu Thr Gln His Gly
145 150 155 160

Thr Ile Leu Ile Lys Val Glu Tyr Lys Gly Glu Asp Val Pro Cys Lys
165 170 175

Ile Pro Phe Ser Thr Glu Asp Gly Gln Gly Lys Ala His Asn Gly Arg
180 185 190

Leu Ile Thr Ala Asn Pro Val Val Thr Lys Lys Glu Glu Pro Val Asn
195 200 205

Ile Glu Ala Glu Pro Pro Phe Gly Glu Ser Asn Ile Val Ile Gly Ile
210 215 220

Gly Asp Asn Ala Leu Lys Ile Asn Trp Tyr Lys Lys Gly Ser Ser Ile
225 230 235 240

Gly Arg Arg Asp Lys Arg Asp Lys Leu Gln Leu Lys Gly Met Ser Tyr
245 250 255

Ser Met Cys Thr Gly Lys Phe Lys Ile Val Lys Glu Ile Ala Glu Thr
260 265 270

Gln His Gly Thr Ile Val Ile Arg Val Gln Tyr Glu Gly Asp Gly Ser
275 280 285

Pro Cys Lys Ile Pro Phe Glu Ile Thr Asp Leu Glu Lys Arg His Val
290 295 300

Leu Gly Arg Leu Ile Thr Val Asn Pro Ile Val Thr Glu Lys Asp Ser
305 310 315 320

Pro Val Asn Ile Glu Ala Glu Pro Pro Phe Gly Asp Ser Tyr Ile Ile
325 330 335

Val Gly Val Glu Pro Gly Gln Leu Lys Leu Asn Trp Phe Lys Lys Gly
340 345 350

Ser Ser Ile Gly Arg Arg Asp Lys Arg Asp Lys Leu Thr Leu Lys Gly
355 360 365

Met Ser Tyr Val Met Cys Thr Gly Ser Phe Lys Leu Glu Lys Glu Val
370 375 380

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

Thr Asp Ala Pro Cys Lys Ile Pro Phe Ser Thr Gln Asp Glu Lys Gly
405 410 415

Val Thr Gln Asn Gly Arg Leu Ile Thr Ala Asn Pro Ile Val Thr Asp
420 425 430

Lys Glu Lys Pro Val Asn Ile Glu Thr Glu Pro Pro Phe Gly Glu Ser
435 440 445

Tyr Ile Ile Val Gly Ala Gly Glu Lys Ala Leu Lys Leu Ser Trp Phe
450 455 460

Lys Lys Gly Ser Ser Ile Gly Arg Arg Asp Lys Arg Ser Val Ala Leu
465 470 475 480

Ala Pro His Val Gly Leu Gly Leu Glu Thr Arg Thr Glu Thr Trp Met
485 490 495

Ser Ser Glu Gly Ala Trp Lys Gln Ile Gln Lys Val Glu Thr Trp Ala
500 505 510

Leu Arg His Pro
515

<210> 146
<211> 537
<212> PRT
<213> Artificial Sequence

<220>
<223> Amino acid sequence of the chimeric polyepitope of DENV2

<400> 146

Lys Ser Ile Glu Asp Asn Pro Glu Ile Glu Asp Asp Ile Phe Arg Lys
1 5 10 15

Lys Arg Leu Thr Ile Met Asp Leu His Pro Gly Ala Gly Lys Thr Lys
20 25 30

Arg Tyr Leu Pro Ala Ile Val Arg Glu Ala Ile Lys Arg Gly Leu Arg
35 40 45

Thr Leu Ile Leu Ala Pro Thr Arg Val Val Ala Ala Glu Met Glu Glu
50 55 60

Ala Leu Arg Gly Leu Pro Ile Arg Tyr Gln Thr Pro Ala Ile Arg Ala
65 70 75 80

Glu His Thr Gly Arg Glu Ile Val Asp Leu Met Cys His Ala Thr Phe
85 90 95

Thr Met Arg Leu Leu Ser Pro Val Arg Val Pro Asn Tyr Asn Leu Ile
100 105 110

Ile Met Asp Glu Ala His Phe Thr Asp Pro Ala Ser Ile Ala Ala Arg
115 120 125

Gly Tyr Ile Ser Thr Arg Val Glu Met Gly Glu Ala Ala Gly Ile Phe
130 135 140

Met Thr Ala Thr Pro Pro Gly Ser Arg Asp Pro Phe Pro Gln Ser Asn
145 150 155 160

Ala Pro Ile Met Asp Glu Glu Arg Glu Ile Pro Glu Arg Ser Trp Asn
165 170 175

Ser Gly His Glu Trp Val Thr Asp Glu Asp Cys Ala His Trp Lys Glu
180 185 190

Ala Lys Met Leu Leu Asp Asn Ile Asn Thr Pro Glu Gly Ile Ile Pro
195 200 205

Ser Met Phe Glu Pro Glu Arg Glu Lys Val Asp Ala Ile Asp Gly Glu
210 215 220

Tyr Arg Leu Arg Gly Glu Ala Arg Lys Thr Phe Val Asp Leu Met Arg
225 230 235 240

Arg Gly Asp Leu Pro Val Trp Leu Ala Tyr Lys Val Ala Ala Glu Gly
245 250 255

Ile Asn Tyr Ala Asp Arg Arg Trp Cys Phe Asp Gly Ile Lys Asn Asn
260 265 270

Gln Ile Leu Glu Glu Asn Val Glu Val Glu Ile Trp Thr Lys Glu Gly
275 280 285

Glu Arg Lys Lys Leu Lys Pro Arg Trp Leu Asp Ala Arg Ile Tyr Ser
290 295 300

Asp Pro Leu Ala Leu Lys Glu Phe Lys Glu Phe Ala Ala Gly Ile Thr
305 310 315 320

Thr Gln Glu Ser Glu Ser Asn Ile Leu Asp Ile Asp Leu Arg Pro Ala
325 330 335

Ser Ala Trp Thr Leu Tyr Ala Val Ala Thr Thr Phe Val Thr Pro Met
340 345 350

Leu Arg His Ser Ile Glu Asn Ser Ser Val Asn Val Ser Leu Thr Ala
355 360 365

Ile Ala Asn Gln Ala Thr Val Leu Met Gly Leu Gly Lys Gly Trp Pro
370 375 380

Leu Ser Lys Met Asp Ile Gly Val Pro Leu Leu Ala Ile Gly Cys Tyr
385 390 395 400

Ser Gln Val Leu Asp Ile Ile Gly Lys Arg Ile Glu Lys Ile Lys Gln
405 410 415

Glu His Glu Thr Ser Trp His Tyr Asp Gln Asp His Pro Tyr Lys Thr
420 425 430

Trp Ala Tyr His Gly Ser Tyr Glu Thr Lys Gln Thr Gly Ser Ala Ser
435 440 445

Ser Met Val Asn Gly Val Val Arg Leu Leu Thr Lys Pro Trp Asp Val
450 455 460

Val Pro Met Val Thr Gln Met Ala Met Thr Asp Thr Thr Pro Phe Gly
465 470 475 480

Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg Thr Gln Glu Pro
485 490 495

Lys Glu Gly Thr Lys Lys Leu Met Lys Ile Thr Ala Glu Trp Leu Trp
500 505 510

Lys Glu Leu Gly Lys Lys Lys Thr Pro Arg Met Cys Thr Arg Glu Glu
515 520 525

Phe Thr Arg Lys Val Arg Ser Asn Ala
530 535

<210> 147

<211> 538

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the chimeric polyepitope of DENV3

<400> 147

Ala Glu Pro Asp Gly Pro Thr Pro Glu Leu Glu Glu Glu Met Phe Lys
1 5 10 15

Lys Arg Asn Leu Thr Ile Met Asp Leu His Pro Gly Ser Gly Lys Thr
20 25 30

Arg Lys Tyr Leu Pro Ala Ile Val Arg Glu Ala Ile Lys Arg Arg Leu
35 40 45

Arg Thr Leu Ile Leu Ala Pro Thr Arg Val Val Ala Ala Glu Met Glu
50 55 60

Glu Ala Leu Lys Gly Leu Pro Ile Arg Tyr Gln Thr Thr Ala Thr Lys
65 70 75 80

Ser Glu His Thr Gly Arg Glu Ile Val Asp Leu Met Cys His Ala Thr
85 90 95

Phe Thr Met Arg Leu Leu Ser Pro Val Arg Val Pro Asn Tyr Asn Leu
100 105 110

Ile Ile Met Asp Glu Ala His Phe Thr Asp Pro Ala Ser Ile Ala Ala
115 120 125

Arg Gly Tyr Ile Ser Thr Arg Val Gly Met Gly Glu Ala Ala Ala Ile
130 135 140

Phe Met Thr Ala Thr Pro Pro Gly Thr Ala Asp Ala Phe Pro Gln Ser
145 150 155 160

Asn Ala Pro Ile Gln Asp Glu Glu Arg Asp Ile Pro Glu Arg Ser Trp
165 170 175

Asn Ser Gly Asn Glu Trp Ile Thr Asp Glu Asp His Ala His Trp Thr
180 185 190

Glu Ala Lys Met Leu Leu Asp Asn Ile Asn Thr Pro Glu Gly Ile Ile
195 200 205

Pro Ala Leu Phe Glu Pro Glu Arg Glu Lys Ser Ala Ala Ile Asp Gly
210 215 220

Glu Tyr Arg Leu Lys Gly Glu Ser Arg Lys Thr Phe Val Glu Leu Met
225 230 235 240

Arg Arg Gly Asp Leu Pro Val Trp Leu Ala His Lys Val Ala Ser Glu
245 250 255

Gly Ile Lys Tyr Thr Asp Arg Lys Trp Cys Phe Asp Gly Gln Arg Asn
260 265 270

Asn Gln Ile Leu Glu Glu Asn Met Asp Val Glu Ile Trp Thr Lys Glu
275 280 285

Gly Glu Lys Lys Lys Leu Arg Pro Arg Trp Leu Asp Ala Arg Thr Tyr
290 295 300

Ser Asp Pro Leu Ala Leu Lys Glu Phe Lys Asp Phe Ala Ala Gly Glu
305 310 315 320

Pro Gly Val Val Ser Pro Thr Ser Tyr Leu Asp Val Asp Leu His Pro
325 330 335

Ala Ser Ala Trp Thr Leu Tyr Ala Val Ala Thr Thr Val Ile Thr Pro
340 345 350

Met Leu Arg His Thr Ile Glu Asn Ser Thr Ala Asn Val Ser Leu Ala
355 360 365

Ala Ile Ala Asn Gln Ala Val Val Leu Met Gly Leu Asp Lys Gly Trp
370 375 380

Pro Ile Ser Lys Met Asp Leu Gly Val Pro Leu Leu Ala Leu Gly Cys
385 390 395 400

Tyr Ser Gln Val Met Asp Val Ile Gly Glu Arg Ile Lys Arg Ile Lys
405 410 415

Glu Glu His Asn Ser Thr Trp His Tyr Asp Asp Glu Asn Pro Tyr Lys
420 425 430

Thr Trp Ala Tyr His Gly Ser Tyr Glu Val Lys Ala Thr Gly Ser Ala
435 440 445

Ser Ser Met Ile Asn Gly Val Val Lys Leu Leu Thr Lys Pro Trp Asp
450 455 460

Val Val Pro Met Val Thr Gln Met Ala Met Thr Asp Thr Thr Pro Phe
465 470 475 480

Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg Thr Pro Arg
485 490 495

Ser Met Pro Gly Thr Arg Arg Val Met Gly Ile Thr Ala Glu Trp Leu
500 505 510

Trp Arg Thr Leu Gly Arg Asn Lys Lys Pro Arg Leu Cys Thr Arg Glu
515 520 525

Glu Phe Thr Lys Lys Val Arg Thr Asn Ala
530 535

<210> 148

<211> 534

<212> PRT

<213> Artificial Sequence

<220>

<223> Amino acid sequence of the chimeric polyepitope of DENV4

<400> 148

Arg Ile Gly Glu Pro Asp Tyr Glu Val Asp Glu Asp Ile Phe Arg Lys
1 5 10 15

Lys Arg Leu Thr Ile Met Asp Leu His Pro Gly Ala Gly Lys Thr Lys
20 25 30

Arg Ile Leu Pro Ser Ile Val Arg Glu Ala Leu Lys Arg Arg Leu Arg
35 40 45

Thr Leu Ile Leu Ala Pro Thr Arg Val Val Ala Ala Glu Met Glu Glu
50 55 60

Ala Leu Arg Gly Leu Pro Ile Arg Tyr Gln Thr Pro Ala Val Lys Ser
65 70 75 80

Glu His Thr Gly Arg Glu Ile Val Asp Leu Met Cys His Ala Thr Phe
85 90 95

Thr Thr Arg Leu Leu Ser Ser Thr Arg Val Pro Asn Tyr Asn Leu Ile
100 105 110

Val Met Asp Glu Ala His Phe Thr Asp Pro Ser Ser Val Ala Ala Arg
115 120 125

Gly Tyr Ile Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe
130 135 140

Met Thr Ala Thr Pro Pro Gly Ala Thr Asp Pro Phe Pro Gln Ser Asn
145 150 155 160

Ser Pro Ile Glu Asp Ile Glu Arg Glu Ile Pro Glu Arg Ser Trp Asn
165 170 175

Thr Gly Phe Asp Trp Ile Thr Asp Glu Asp His Ala His Trp Thr Glu
180 185 190

Ala Lys Met Leu Leu Asp Asn Ile Tyr Thr Pro Glu Gly Ile Ile Pro
195 200 205

Thr Leu Phe Gly Pro Glu Arg Glu Lys Thr Gln Ala Ile Asp Gly Glu
210 215 220

Phe Arg Leu Arg Gly Glu Gln Arg Lys Thr Phe Val Glu Leu Met Arg
225 230 235 240

Arg Gly Asp Leu Pro Val Trp Leu Ser Tyr Lys Val Ala Ser Ala Gly
245 250 255

Ile Ser Tyr Lys Asp Arg Glu Trp Cys Phe Thr Gly Glu Arg Asn Asn
260 265 270

Gln Ile Leu Glu Glu Asn Met Glu Val Glu Ile Trp Thr Arg Glu Gly
275 280 285

Glu Lys Lys Lys Leu Arg Pro Arg Trp Leu Asp Ala Arg Val Tyr Ala
290 295 300

Asp Pro Met Ala Leu Lys Asp Phe Lys Glu Phe Ala Ser Gly Val Lys
305 310 315 320

Thr Glu Thr Thr Ile Leu Asp Val Asp Leu Arg Pro Ala Ser Ala Trp
325 330 335

Thr Leu Tyr Ala Val Ala Thr Thr Ile Leu Thr Pro Met Leu Arg His
340 345 350

Thr Ile Glu Asn Thr Ser Ala Asn Leu Ser Leu Ala Ala Ile Ala Asn
355 360 365

Gln Ala Ala Val Leu Met Gly Leu Gly Lys Gly Trp Pro Leu His Arg
370 375 380

Met Asp Leu Gly Val Pro Leu Leu Ala Met Gly Cys Tyr Ser Gln Val
385 390 395 400

Met Thr Ile Ile Gly Arg Arg Leu Gln Arg Leu Gln Glu Glu His Lys
405 410 415

Glu Thr Trp His Tyr Asp Gln Glu Asn Pro Tyr Arg Thr Trp Ala Tyr
420 425 430

His Gly Ser Tyr Glu Ala Pro Ser Thr Gly Ser Ala Ser Ser Met Val
435 440 445

Asn Gly Val Val Lys Leu Leu Thr Lys Pro Trp Asp Val Ile Pro Met
450 455 460

Val Thr Gln Leu Ala Met Thr Asp Thr Thr Pro Phe Gly Gln Gln Arg
465 470 475 480

Val Phe Lys Glu Lys Val Asp Thr Arg Thr Pro Gln Pro Lys Pro Gly
485 490 495

Thr Arg Met Val Met Thr Thr Thr Ala Asn Trp Leu Trp Ala Leu Leu
500 505 510

Gly Lys Lys Lys Asn Pro Arg Leu Cys Thr Arg Glu Glu Phe Ile Ser
515 520 525

Lys Val Arg Ser Asn Ala
530

<210> 149
<211> 22243
<212> DNA
<213> Artificial Sequence

<220>
<223> Complete optimised nucleotide sequence of the polynucleotide
encoding pTM-MVDVax11

<220>
<221> misc_feature
<222> (1)..(8)
<223> NotI

<220>
<221> misc_feature
<222> (9)..(28)
<223> T7 promoter

<220>
<221> misc_feature
<222> (29)..(82)
<223> Hammerhead ribozyme

<220>
<221> misc_feature
<222> (83)..(189)
<223> MV Leader and N promoter

<220>
<221> misc_feature
<222> (190)..(1767)
<223> MV N ORF

<220>
<221> misc_feature
<222> (1768)..(1888)
<223> MV N-P intergenic

<220>
<221> misc_feature
<222> (1889)..(3412)
<223> MV P ORF

<220>
 <221> misc_feature
 <222> (3413)..(3531)
 <223> MV ATU2

<220>
 <221> misc_feature
 <222> (3532)..(6699)
 <223> DENV1 NS polyepitope/DENV tetra EDIII/ectoM

<220>
 <221> misc_feature
 <222> (6700)..(6813)
 <223> MV P-M intergenic

<220>
 <221> misc_feature
 <222> (6814)..(7803)
 <223> MV M ORF

<220>
 <221> misc_feature
 <222> (7804)..(8806)
 <223> MV M-F intergenic

<220>
 <221> misc_feature
 <222> (8807)..(10468)
 <223> MV F ORF

<220>
 <221> misc_feature
 <222> (10469)..(10628)
 <223> MV-F-H intergenic

<220>
 <221> misc_feature
 <222> (10629)..(12482)
 <223> MV H ORF

<220>
 <221> misc_feature
 <222> (12483)..(12591)
 <223> MV H-L intergenic

<220>
 <221> misc_feature
 <222> (12592)..(19143)
 <223> MV L ORF

<220>
 <221> misc_feature
 <222> (19144)..(19252)

<223> MV Trailer

<220>

<221> misc_feature

<222> (19253)..(19336)

<223> HDV ribozyme

<220>

<221> misc_feature

<222> (19337)..(19478)

<223> T7 terminator

<220>

<221> misc_feature

<222> (19479)..(19486)

<223> Not I

<220>

<221> misc_feature

<222> (19487)..(22243)

<223> Not I

<400> 149

gcgggccgcta atacgactca ctatagggcc aactttgttt ggtctgatga gtccgtgagg 60

acgaaacccg gagtcccggg tcaccaaaca aagttgggta aggatagttc aatcaatgat 120

catcttctag tgcacttagg attcaagatc ctattatcag ggacaagagc aggattaggg 180

atatccgaga tggccacact ttttaaggagc ttagcattgt tcaaaagaaa caaggacaaa 240

ccacccatta catcaggatc cgggtggagcc atcagaggaa tcaaacacat tattatagta 300

ccaatccctg gagattcctc aattaccact cgatccagac ttctggaccg gttggtgagg 360

ttaattggaa acccggatgt gagcggggccc aaactaacag gggcactaat aggtatatta 420

tccttatttg tggagtctcc aggtcaattg attcagagga tcaccgatga ccctgacgtt 480

agcataaggc tgtagaggt tgtccagagt gaccagtcac aatctggcct taccttcgca 540

tcaagaggta ccaacatgga ggatgaggcg gaccaatact tttcacatga tgatccaatt 600

agtagtgatc aatccaggtt cggatggttc gggaacaagg aaatctcaga tattgaagtg 660

caagaccctg aggattcaa catgattctg ggtaccatcc tagcccaaatt ttgggtcttg 720

ctcgcaaagg cggttacggc cccagacacg gcagctgatt cggagctaag aaggtggata 780

aagtacacc aacaaagaag ggtagttggg gaatttagat tggagagaaa atggttggat 840

gtggtgagga acaggattgc cgaggacctc tccttacgcc gattcatggt cgctctaadc 900

ctggatatca agagaacacc cggaaacaaa cccaggattg ctgaaatgat atgtgacatt 960

gatacatata tcgtagaggc aggattagcc agttttatcc tgactattaa gtttgggata	1020
gaaactatgt atcctgctct tggactgcat gaatttgctg gtgagttatc cacacttgag	1080
tccttgatga acctttacca gcaaattgggg gaaactgcac cctacatggt aatcctggag	1140
aactcaattc agaacaagtt cagtgcagga tcataccctc tgctctggag ctatgccatg	1200
ggagtaggag tggaacttga aaactccatg ggaggtttga actttggccg atcttacttt	1260
gatccagcat attttagatt agggcaagag atggtaagga ggtcagctgg aaaggtcagt	1320
tccacattgg catctgaact cggtatcact gccgaggatg caaggcttgt ttcagagatt	1380
gcaatgcata ctactgagga caagatcagt agagcggttg gaccagaca agcccaagta	1440
tcattttctac acggtgatca aagtgagaat gagctaccga gattgggggg caaggaagat	1500
aggaggggtca aacagagtcg aggagaagcc agggagagct acagagaaac cgggcccagc	1560
agagcaagtg atgcgagagc tgcccatctt ccaaccggca caccctaga cattgacact	1620
gcaacggagt ccagccaaga tccgcaggac agtcgaaggt cagctgacgc cctgcttagg	1680
ctgcaagcca tggcaggaat ctcggaagaa caaggctcag acacggacac ccctatagtg	1740
tacaatgaca gaaatcttct agactaggtg cgagaggccg agggccagaa caacatccgc	1800
ctaccatcca tcattgttat aaaaaactta ggaaccaggt ccacacagcc gccagcccat	1860
caaccatcca ctcccacgat tggagccaat ggcagaagag caggcacgcc atgtcaaaaa	1920
cggactggaa tgcattccggg ctctcaaggc cgagcccatt ggctcactgg ccatcgagga	1980
agctatggca gcatggtcag aaatatcaga caaccagga caggagcgag ccacctgcag	2040
ggaagagaag gcaggcagtt cgggtctcag caaacatgc ctctcagcaa ttgatcaac	2100
tgaaggcggg gcacctcgca tccgcgggtc gggacctgga gagagcgatg acgacgtga	2160
aactttggga atcccccaa gaaatctcca ggcataagc actgggttac agtgttatta	2220
cgtttatgat cacagcgggtg aagcgggtta gggaatcaa gatgctgact ctatcatggt	2280
tcaatcaggc cttgatgggt atagcacct ctcaggagga gacaatgaat ctgaaaacag	2340
cgatgtggat attggcgaac ctgataccga gggatatgct atcactgacc ggggatctgc	2400
tcccatctct atgggggtca gggcttctga tgttgaaact gcagaaggag gggagatcca	2460
cgagctcctg agactccaat ccagaggcaa caactttccg aagcttggga aaactctcaa	2520
tgttcctccg ccccgacc cggtagggc cagcacttcc gggacacca ttaaaaaggg	2580

cacagacgcg agattagcct catttggaac ggagatcgcg tctttattga caggtggtgc	2640
aacccaatgt gctcgaaagt caccctcgga accatcaggg ccaggtgcac ctgcggggaa	2700
tgtccccgag tgtgtgagca atgccgcact gatacaggag tggacacccg aatctggtac	2760
cacaatctcc ccgagatccc agaataatga agaaggggga gactattatg atgatgagct	2820
gttctctgat gtccaagata ttaaaacagc cttggccaaa atacacgagg ataatcagaa	2880
gataatctcc aagctagaat cactgctgtt attgaaggga gaagttgagt caattaagaa	2940
gcagatcaac aggcaaaata tcagcatatc caccctggaa ggacacctct caagcatcat	3000
gatcgccatt cctggacttg ggaaggatcc caacgacccc actgcagatg tcgaaatcaa	3060
tcccgacttg aaacccatca taggcagaga ttcaggccga gcactggccg aagttctcaa	3120
gaaacccgtt gccagccgac aactccaagg aatgacaaat ggacggacca gttccagagg	3180
acagctgctg aaggaatttc agctaaagcc gatcgggaaa aagatgagct cagccgtcgg	3240
gtttgttcct gacaccggcc ctgcatcacg cagtgtaatc cgctccatta taaaatccag	3300
ccggctagag gaggatcgga agcgttacct gatgactctc cttgatgata tcaaaggagc	3360
caatgatctt gccaaagtcc accagatgct gatgaagata ataatgaagt agctacagct	3420
caacttacct gccaacccca tgccagtcga cccaactagc ctaccctcca tcattgttat	3480
aaaaaactta ggaaccaggt ccacacagcc gccagcccat caacgcgtac gatggcatca	3540
caggagggac cactgcccga aattgaggac gaagtgttta gaaagcgaaa tctgactatt	3600
atggacctgc accccggatc tggcaagacc cggagatacc tgccagccat cgtgaggagg	3660
gctattaagc ggaaactgag aacactgatc ctggccccaa ctcgcgtggt cgcttccgaa	3720
atggctgagg ccctgaaagg catgcccata cggtatcaga ccacagcagt gaagtctgaa	3780
cataccggca aggagattgt ggacctgatg tgccacgcca ctttcacat gcgactgctg	3840
agcccagtgc ggggtcccaa ctacaatatg atcattatgg acgaggccca ctttactgat	3900
cccagctcca tcgccgctag aggatatatt tccaccaggg tgggaatggg cgaggcagca	3960
gctatcttca tgacagcaac tccccctggc agcgtggagg catttcctca gtccaacgcc	4020
gtcatccagg acgaggagcg ggacattcct gagcggagct ggaattctgg gtacgaatgg	4080
atcacagacg aggatcatgc aactggact gaagccaaga tgctgctgga caacattaat	4140
actcctgagg gaatcattcc agctctgttc gagcccgaaa gagagaagtc tgcagccatc	4200

gacggcgagt atagactgag gggagaggcc cggaagacct tcgtggaact gatgaggcgc	4260
ggcgatctgc ccgtgtggct gagttacaag gtcgcttcag agggattcca gtatagtgc	4320
cgacggtggt gctttgatgg cgaacgcaac aatcagggtgc tggaggagaa catggatgtc	4380
gagatttgga caaaggaagg cgagcggaag aaactgcgcc cacgatggct ggacgctcgg	4440
acttacagcg atcccctggc actgagagaa ttcaaagagt ttgctgcagg ggtggccgtc	4500
gagaatcacc atcacgccgc tatgctggac gtggatctgc atcctgccag tgcttgacc	4560
ctgtatgcag tggccactac catcattacc ccaatgatgc gccacacaat cgagaacaca	4620
actgccaata tctcactgac agctattgca aaccaggcag ccattctgat gggactggac	4680
aaaggctggc ccatcagcaa gatggatatt ggcgtgcctc tgctggccct ggggtgttac	4740
agtcagggtgc tggacatcat tggccagagg atcgagaaca ttaagcatga gcacaaatca	4800
acctggcatt acgacgaaga taatccctat aagacatggg cctaccacgg aagctatgag	4860
gtgaaacctt caggcagcgc cagcagcatg gtcaacgggg tgggtcaagct gctgaccaa	4920
ccttgggacg tgatcccaat ggtcactcag attgccatga ccgataccac cccattcggc	4980
cagcagcggg tgttcaagga gaagggtggac acccgcacac ctaaggctaa acgagggact	5040
gcacagatca tggagggtgc cgccaagtgg ctgtggggat tcctgtccag gaacaagaag	5100
ccaagaatct gtaccagga agagttcaca agaaagggtcc ggtcaaacgc cggcatcata	5160
ttcattcttc ttatgctggt tacaccgtct atggcggaga aacttcgaat caaaggatatg	5220
agctatacga tgtgcagcgg caagttcaag atcgagaagg aaatggctga aaccagcac	5280
ggtacaactg tgggtcaaagt caaatatgag ggggctggcg ctccctgtaa agtaccatt	5340
gagattaggg acgtcaataa agagaagggtg gtaggtcgca tcatctccag tacaccttg	5400
gccgagaaca cgaactccgt cacaacata gagttggaac ccccgttcgg agactcatac	5460
attgtgatcg ggggtgggcaa ctctgcactc aactgcatt ggttcaagaa gggaagcagt	5520
atcggccgca gggataagag agacaaactg aaattgaaag gtatgtccta tgccatgtgc	5580
acgaatactt tcgtttctcaa gaaagaagta tctgagactc agcacggaac catcctgatc	5640
aaagtcgagt acaaaggaga agacgtgccc tgtaagatcc cattcagtac cgaggatgga	5700
cagggcaagg cccataacgg caggctgata accgccaacc ctgtggttac aaagaaggaa	5760
gagccagtca atatcgaagc tgagccaccg ttcggggaga gcaacatagt aattggcata	5820

ggggataatg ctttgaagat caactggtac aagaaaggaa gctccattgg ccgaagagat	5880
aagcgcgaca aactccagct gaaaggaatg agctactcca tgtgtactgg gaagttcaag	5940
attgtcaagg aaatcgccga aactcagcat ggcactattg tgatccgcgt gcagtatgaa	6000
ggcgatggta gcccctgcaa gataccattt gaaatcaccg atttggagaa acggcacgtc	6060
ctgggtcggc tcattaccgt gaaccaatc gtgaccgaga aggacagtcc agttaatatc	6120
gaggccgagc ctcctttcgg cgacagttac atcattgtag ggggtggaacc agggcaactg	6180
aagctgaact ggttcaagaa aggcagcagt ataggacggc gggataaacg ggacaaactc	6240
acactgaaag gcatgtcata cgttatgtgc accggctcat tcaaactgga gaaggaagtt	6300
gcagagacac agcatgggac cgtgctcgtg caggtcaaat acgagggcac cgacgctcct	6360
tgcaagattc cgttcagtac acaggacgag aaaggcgtga ctcagaacgg cagattgatt	6420
acagcgaacc ctatcgtgac tgacaaggag aagccagtta acatcgagac tgagccgcct	6480
ttcggagaat catacattat cgtgggagcc ggcgagaagg cactgaaact cagctggttc	6540
aagaagggca gctcaatcgg tcggagagac aagcggctctg tcgccctcgc accgcacgtg	6600
ggcctgggtc tggaaacgag gaccgagacg tggatgagtt ccgaaggcgc atggaagcaa	6660
atccagaaaag tggagacgtg ggccctcagg catccgtaag cgcgacgcgc ttagacgtct	6720
cgcgatcgat actagtacaa cctaaatcca ttataaaaaa cttaggagca aagtgattgc	6780
ctcccaaggt ccacaatgac agagacctac gacttcgaca agtcggcatg ggacatcaaa	6840
gggtcgatcg ctccgataca acccaccacc tacagtgatg gcaggctggg gccccaggtc	6900
agagtcatag atcctgggtc aggcgacagg aaggatgaat gctttatgta catgtttctg	6960
ctgggggttg ttgaggacag cgattcccta gggcctcaa tcgggcgagc atttgggttc	7020
ctgcccttag gtgttggcag atccacagca aagcccga aaactcctcaa agaggccact	7080
gagcttgaca tagttgtag acgtacagca gggctcaatg aaaaactggg gttctacaac	7140
aacacccac taactctcct cacaccttgg agaaagggtc taacaacagg gagtgtcttc	7200
aacgcaaacc aagtgtgcaa tgcggttaat ctgataccgc tcgatacccc gcagaggttc	7260
cgtgttgttt atatgagcat caccgtctt tcggataacg ggtattacac cgttcctaga	7320
agaatgctgg aattcagatc ggtcaatgca gtggccttca acctgctggg gacccttagg	7380
attgacaagg cgataggccc tgggaagatc atcgacaata cagagcaact tcctgaggca	7440

acatttatgg tccacatcgg gaacttcagg agaaagaaga gtgaagtcta ctctgccgat	7500
tattgcaaaa tgaaaatcga aaagatgggc ctggtttttg cacttggtgg gatagggggc	7560
accagtcttc acattagaag cacaggcaaa atgagcaaga ctctccatgc acaactcggg	7620
ttcaagaaga ccttatgtta cccgctgatg gatatcaatg aagaccttaa tcgattactc	7680
tggaggagca gatgcaagat agtaagaatc caggcagttt tgcagccatc agttcctcaa	7740
gaattccgca tttagcagca cgtgatcata aatgatgacc aaggactatt caaagttctg	7800
tagaccgtag tgcccagcaa tgcccgaaaa cgacccccct cacaatgaca gccagaaggc	7860
ccggacaaaa aagccccctc cgaaagactc cacggaccaa gcgagaggcc agccagcagc	7920
cgacggcaag cgcgaaacac aggcggcccc agcacagaac agccctgaca caaggccacc	7980
accagccacc ccaatctgca tcctcctcgt gggacccccg aggaccaacc cccaaggctg	8040
ccccgatcc aaaccaccaa ccgcatcccc accacccccg ggaaagaaac cccagcaat	8100
tggaaggccc ctccccctct tcctcaacac aagaactcca caaccgaacc gcacaagcga	8160
ccgaggtgac ccaaccgcag gcatccgact ccctagacag atcctctctc cccggcaaac	8220
taaacaaaac ttagggccaa ggaacatata cacccaacag aaccagacc ccggcccacg	8280
gcgccgcgcc cccaaccccc gacaaccaga gggagcccc aaccaatccc gccggctccc	8340
ccggtgcccc caggcagggg caccaacccc cgaacagacc cagcacccaa ccatcgacaa	8400
tccaagacgg gggggccccc caaaaaaaag gccccagggg gccgacagcc agcaccgcga	8460
ggaagcccac ccaccccaca cacgaccacg gcaaccaaac cagaaccag accaccctgg	8520
gccaccagct cccagactcg gccatcacc cgcagaaagg aaaggccaca acccgcgcac	8580
cccagccccg atccggcggg gagccacca acccgaacca gcacccaaga gcgatccccg	8640
aaggaccccc gaaccgcaaa ggacatcagt atcccacagc ctctccaagt cccccgtct	8700
cctcctcttc tcgaaggac caaaagatca atccaccaca cccgacgaca ctcaactccc	8760
caccctaata ggagacaccg ggaatcccag aatcaagact catccaatgt ccatcatggg	8820
tctcaagggtg aacgtctctg ccatattcat ggcagtactg ttaactctcc aaacaccac	8880
cggtaaatac cattggggca atctctctaa gataggggtg gtaggaatag gaagtgaag	8940
ctacaaaagt atgactcgtt ccagccatca atcattagtc ataaaattaa tgcccaatat	9000
aactctctc aataactgca cgagggtaga gattgcagaa tacaggagac tactgagaac	9060

agtttttgaa ccaattagag atgcacttaa tgcaatgacc cagaatataa gaccggttca	9120
gagtgtagct tcaagtagga gacacaagag atttgcggga gtagtcctgg caggtgcggc	9180
cctaggcggt gccacagctg ctgagataac agccggcatt gcacttcacc agtccatgct	9240
gaactctcaa gccatcgaca atctgagagc gagcctggaa actactaatc aggcaattga	9300
gacaatcaga caagcagggc aggagatgat attggctgtt caggggtgtcc aagactacat	9360
caataatgag ctgataccgt ctatgaacca actatcttgt gatttaatcg gccagaagct	9420
cgggctcaaa ttgctcagat actatacaga aatcctgtca ttatttggcc ccagtttacg	9480
ggaccccata tctgcggaga tatctatcca ggctttgagc tatgcgcttg gaggagacat	9540
caataaggtg ttagaaaagc tcggatacag tggaggtgat ttactgggca tcttagagag	9600
cggaggaata aaggcccgga taactcacgt cgacacagag tcctacttca ttgtcctcag	9660
tatagcctat ccgacgctgt ccgagattaa gggggtgatt gtccaccggc tagagggggt	9720
ctcgtacaac ataggctctc aagagtggta taccactgtg cccaagtatg ttgcaaccca	9780
agggtacctt atctcgaatt ttgatgagtc atcgtgtact ttcatgccag aggggactgt	9840
gtgcagccaa aatgccttgt acccgatgag tcctctgctc caagaatgcc tccgggggta	9900
caccaagtcc tgtgctcgta cactcgtatc cgggtctttt gggaaccggt tcattttatc	9960
acaagggaac ctaatagcca attgtgcatc aatcctttgc aagtgttaca caacaggaac	10020
gatcattaat caagaccctg acaagatcct aacatacatt gctgccgatc actgcccggt	10080
agtcgaggtg aacggcgtga ccatccaagt cgggagcagg aggtatccag acgctgtgta	10140
cttgcacaga attgacctg gtcctcccat atcattggag aggttggacg tagggacaaa	10200
tctggggaat gcaattgcta agttggagga tgccaaggaa ttgttggagt catcggacca	10260
gatattgagg agtatgaaag gtttatcgag cactagcata gtctacatcc tgattgcagt	10320
gtgtcttgga gggttgatag ggatccccgc tttaatatgt tgctgcaggg ggcgttgtaa	10380
caaaaaggga gaacaagttg gtatgtcaag accaggccta aagcctgatc ttacgggaac	10440
atcaaaatcc tatgtaaggt cgctctgatc ctctacaact cttgaaacac aaatgtccca	10500
caagtctcct cttcgtcatc aagcaaccac cgcaccagc atcaagccca cctgaaatta	10560
tctccggctt ccctctggcc gaacaatatc ggtagttaat caaaacttag ggtgcaagat	10620
catccacaat gtcaccacaa cgagaccgga taaatgcctt ctacaaagat aacccccatc	10680

ccaaggaag taggatagtc attaacagag aacatcttat gattgataga ctttatgttt	10740
tgctggctgt tctgtttgtc atgtttctga gcttgatcgg gttgctagcc attgcaggca	10800
ttagacttca tcgggcagcc atctacaccg cagagatcca taaaagcctc agcaccaatc	10860
tagatgtaac taactcaatc gagcatcagg tcaaggacgt gctgacacca ctcttcaaaa	10920
tcatcgggtga tgaagtgggc ctgaggacac ctgagagatt cactgaccta gtgaaattaa	10980
tctctgacaa gattaaattc cttaatccgg ataggagta cgacttcaga gatctcactt	11040
ggtgtatcaa cccgccagag agaatcaaat tggattatga tcaatactgt gcagatgtgg	11100
ctgctgaaga gctcatgaat gcattgggtga actcaactct actggagacc agaacaacca	11160
atcagttcct agctgtctca aagggaact gctcagggcc cactacaatc agaggtcaat	11220
tctcaaacat gtcgctgtcc ctgtagact tgtatttagg tcgaggttac aatgtgtcat	11280
ctatagtcac tatgacatcc cagggaatgt atgggggaac ttacctagtg gaaaagccta	11340
atctgagcag caaaaggta gagttgtcac aactgagcat gtaccgagtg tttgaagtag	11400
gtgttatcag aaatccgggt ttgggggctc cggtgttcca tatgacaaac tatcttgagc	11460
aaccagtcag taatgatctc agcaactgta tgggtggcttt gggggagctc aaactcgag	11520
ccctttgtca cggggaagat tctatcaciaa ttccctatca gggatcaggg aaaggtgtca	11580
gcttccagct cgtcaagcta ggtgtctgga aatccccaac cgacatgcaa tcctgggtcc	11640
ccttatcaac ggatgatcca gtgatagaca ggctttacct ctcatctcac agaggtgtta	11700
tcgctgacaa tcaagcaaaa tgggctgtcc cgacaacacg aacagatgac aagttgcgaa	11760
tggagacatg cttccaacag gcgtgtaagg gtaaaatcca agcactctgc gagaatccc	11820
agtgggcacc attgaaggat aacaggattc cttcatcagg ggtcttgtct gttgatctga	11880
gtctgacagt tgagcttaaa atcaaaattg cttcgggatt cgggccattg atcacacacg	11940
gttcagggat ggacctatac aaatccaacc acaacaatgt gtattggctg actatccgc	12000
caatgaagaa cctagcctta ggtgtaatca acacattgga gtggataccg agattcaagg	12060
ttagtcccta cctcttcact gtcccaatta aggaagcagg cgaagactgc catgccccaa	12120
catactacc tgcggagggtg gatgggtgatg tcaaactcag ttccaatctg gtgattctac	12180
ctggtcaaga tctccaatat gttttggcaa cctacgatac ttccagggtt gaacatgctg	12240
tggtttatta cgtttacagc ccaagccgct cattttctta cttttatcct tttaggttgc	12300

ctataaaggg ggtcccatc gaattacaag tggaatgctt cacatgggac caaaaactct	12360
ggtgccgtca cttctgtgtg cttgcggact cagaatctgg tggacatatc actcactctg	12420
ggatggtggg catgggagtc agctgcacag tcacccggga agatggaacc aatcgcagat	12480
agggctgcta gtgaaccaat cacatgatgt caccagaca tcaggcatac ccactagtgt	12540
gaaatagaca tcagaattaa gaaaaacgta gggccaagt ggttccccgt tatggactcg	12600
ctatctgtca accagatctt ataccctgaa gttcacctag atagcccgat agttaccaat	12660
aagatagtag ccatcctgga gtatgctcga gtccctcacg cttacagcct ggaggaccct	12720
acactgtgtc agaacatcaa gcaccgccta aaaaacggat tttccaacca aatgattata	12780
aacaatgtgg aagttgggaa tgtcatcaag tccaagctta ggagttatcc ggcccactct	12840
catattccat atccaaattg taatcaggat ttatttaaca tagaagacaa agagtcaacg	12900
aggaagatcc gtgaactcct caaaaagggg aattcgctgt actccaaagt cagtgataag	12960
gttttccaat gcttaaggga cactaactca cggcttggcc taggctccga attgaggag	13020
gacatcaagg agaaagtta taacttggga gtttacatgc acagctcca gtggtttgag	13080
ccctttctgt tttggtttac agtcaagact gagatgaggt cagtgattaa atcacaacc	13140
catacttgcc ataggaggag acacacacct gtattcttca ctggtagtgc agttgagttg	13200
ctaactcttc gtgaccttgt tgctataatc agtaaagagt ctcaacatgt atattacctg	13260
acatttgaac tggttttgat gtatttgtat gtcatagagg ggaggttaat gacagagacc	13320
gctatgacta ttgatgctag gtatacagag cttctaggaa gagtcagata catgtggaaa	13380
ctgatagatg gtttcttccc tgcactcggg aatccaactt atcaaattgt agccatgctg	13440
gagcctcttt cacttgctta cctgcagctg agggatataa cagtagaact cagagggtgt	13500
ttccttaacc actgctttac tgaaatacat gatgttcttg accaaaacgg gttttctgat	13560
gaaggactt atcatgagtt aactgaagct ctagattaca ttttcataac tgatgacata	13620
catctgacag gggagatttt ctcatTTTTc agaagtttcg gccacccag acttgaagca	13680
gtaacggctg ctgaaaatgt taggaaatac atgaatcagc ctaaagtcac tgtgtatgag	13740
actctgatga aaggctatgc catattttgt ggaatcataa tcaacggcta tcgtgacagg	13800
cacggaggca gttggccacc gctgaccctc cccctgcatg ctgcagacac aatccggaat	13860
gctcaagctt caggtgaagg gttaacacat gagcagtgcg ttgataactg gaaatctttt	13920

gctggagtga aatttggtg ctttatgcct cttagcctgg atagtgatct gacaatgtac	13980
ctaaaggaca aggcaattgc tgctctccaa aggggaatggg attcagttta cccgaaagag	14040
ttcctgcgtt acgaccctcc caagggaacc gggtcacgga ggcttgtaga tgttttcctt	14100
aatgattcga gctttgaccc atatgatgtg ataatgtatg ttgtaagtgg agcttacctc	14160
catgaccctg agttcaacct gtcttacagc ctgaaagaaa aggagatcaa ggaaacaggt	14220
agactttttg ctaaaatgac ttacaaaatg agggcatgcc aagtgattgc tgaaaatcta	14280
atctcaaacg ggattggcaa atattttaag gacaatggga tggccaagga tgagcacgat	14340
ttgactaagg cactccacac tctagctgtc tcaggagtcc ccaaagatct caaagaaagt	14400
cacagggggg ggccagtctt aaaaacctac tcccgaagcc cagtccacac aagtaccagg	14460
aacgtgagag cagcaaaagg gtttataggg ttccctcaag taattcggca ggaccaagac	14520
actgatcatc cggagaatat ggaagcttac gagacagtca gtgcatttat cacgactgat	14580
ctcaagaagt actgccttaa ttggagatat gagaccatca gcttgtttgc acagaggcta	14640
aatgagattt acggattgcc ctcatTTTTc cagtggctgc ataagaggct tgagacctct	14700
gtcctgtatg taagtgaccc tcattgcccc cccgacctg acgccccat cccgttatat	14760
aaagtcccca atgatcaaat cttcattaag taccctatgg gaggtataga aggggtattgt	14820
cagaagctgt ggaccatcag caccattccc tatctatacc tggctgctta tgagagcgga	14880
gtaaggattg cttcgttagt gcaaggggac aatcagacca tagccgtaac aaaaagggta	14940
cccagcacat ggccctacaa ccttaagaaa cggaagctg ctagagtaac tagagattac	15000
tttgtaattc ttaggcaaag gctacatgat attggccatc acctcaaggc aaatgagaca	15060
attgtttcat cacatTTTTt tgtctattca aaaggaatat attatgatgg gctacttgtg	15120
tccaatcac tcaagagcat cgcaagatgt gtattctggg cagagactat agttgatgaa	15180
acaagggcag catgcagtaa tattgctaca acaatggcta aaagcatcga gagaggttat	15240
gaccgttacc ttgcatattc cctgaacgtc ctaaaagtga tacagcaa tctgatctct	15300
cttggcttca caatcaattc aaccatgacc cgggatgtag tcatacccct cctcaciaac	15360
aacgacctct taataaggat ggcactgttg cccgtccta ttggggggat gaattatctg	15420
aatatgagca ggctgtttgt cagaaacatc ggtgatccag taacatcatc aattgctgat	15480
ctcaagagaa tgattctcgc ctactaatg cctgaagaga ccctccatca agtaatgaca	15540

caacaaccgg gggactcttc attcctagac tgggctagcg acccttactc agcaaattctt	15600
gtatgtgtcc agagcatcac tagactcctc aagaacataa ctgcaagggtt tgtcctgac	15660
catagtccaa acccaatggtt aaaaggatta ttccatgatg acagtaaaga agaggacgag	15720
ggactggcgg cattcctcat ggacaggcat attatagtac ctagggcagc tcatgaaatc	15780
ctggatcata gtgtcacagg ggcaagagag tctattgcag gcatgctgga taccacaaaa	15840
ggcttgattc gagccagcat gaggaagggg gggttaacct ctcgagtgat aaccagattg	15900
tccaattatg actatgaaca attcagagca gggatgggtgc tattgacagg aagaaagaga	15960
aatgtcctca ttgacaaaga gtcattgttca gtgcagctgg cgagagctct aagaagccat	16020
atgtgggcga ggctagctcg aggacggcct atttacggcc ttgaggtccc tgatgtacta	16080
gaatctatgc gaggccacct tattcggcgt catgagacat gtgtcatctg cgagtgtgga	16140
tcagtcaact acggatgggt ttttgtcccc tcgggttgcc aactggatga tattgacaag	16200
gaaacatcat ccttgagagt cccatatatt ggttctacca ctgatgagag aacagacatg	16260
aagcttgcct tcgtaagagc cccaagtcga tccttgcgat ctgctgttag aatagcaaca	16320
gtgtactcat gggcttacgg tgatgatgat agctcttgga acgaagcctg gttgttggt	16380
aggcaaaggg ccaatgtgag cctggaggag ctaagggtga tcactcccat ctcaacttcg	16440
actaathtag cgcatagggt gagggatcgt agcactcaag tgaaatactc aggtacatcc	16500
cttgtccgag tggcgaggta taccacaatc tccaacgaca atctctcatt tgtcatatca	16560
gataagaagg ttgatactaa ctttatatac caacaaggaa tgcttctagg gttgggtgtt	16620
ttagaaacat tgtttcgact cgagaaagat accggatcat ctaacacggt attacatctt	16680
cacgtcgaag cagattgttg cgtgatcccg atgatagatc atcccaggat acccagctcc	16740
cgcaagctag agctgagggc agagctatgt accaaccat tgatatatga taatgcacct	16800
ttaatgaca gagatgcaac aaggctatac acccagagcc ataggaggca ctttgtggaa	16860
tttgttacat ggtccacacc ccaactatat cacattttag ctaagtccac agcactatct	16920
atgattgacc tggtaacaaa atttgagaag gaccatatga atgaaatttc agctctcata	16980
ggggatgacg atatcaatag tttcataact gagtttctgc tcatagagcc aagattattc	17040
actatctact tgggccagtg tgcggccatc aattgggcat ttgatgtaca ttatcataga	17100
ccatcaggga aatatcagat gggtagctg ttgtcatcgt tcctttctag aatgagcaaa	17160

ggagtgttta aggtgcttgt caatgctcta agccacccaa agatctacaa gaaattctgg	17220
catttgtgta ttatagagcc tatccatggg ccttcacttg atgctcaaaa cttgcacaca	17280
actgtgtgca acatgggtta cacatgctat atgacctacc tcgacctgtt gttgaatgaa	17340
gagttagaag agttcacatt tctcttgtgt gaaagcgacg aggatgtagt accggacaga	17400
ttcgacaaca tccaggcaaa acacttatgt gttctggcag atttgtactg tcaaccaggg	17460
acctgcccac caattcgagg tctaagaccg gtagagaaat gtgcagttct aaccgaccat	17520
atcaaggcag aggctatgtt atctccagca ggatcttcgt ggaacataaa tccaattatt	17580
gtagaccatt actcatgctc tctgacttat ctccggcgag gatcgatcaa acagataaga	17640
ttgagagttg atccaggatt ctttttcgac gccctcgctg aggtaaatgt cagtcagcca	17700
aagatcggca gcaacaacat ctcaaatatg agcatcaagg ctttcagacc cccacacgat	17760
gatgttgcaa aattgctcaa agatatcaac acaagcaagc acaatcttcc cttttcaggg	17820
ggcaatctcg ccaattatga aatccatgct ttccgcagaa tcgggttgaa ctcatctgct	17880
tgctacaaag ctgttgagat atcaacatta attaggagat gccttgagcc aggggaggac	17940
ggcttgttct tgggtgaggg atcgggttct atgttgatca cttataaaga gatacttaaa	18000
ctaaacaagt gcttctataa tagtgggggt tccgccaatt ctagatctgg tcaaagggaa	18060
ttagcaccct atccctccga agttggcctt gtcgaacaca gaatgggagt aggtaatatt	18120
gtcaaagtgc tctttaacgg gaggcccgaa gtcacgtggg taggcagtgt agattgcttc	18180
aatttcatag ttagtaatat ccctacctct agtgtgggggt ttatccattc agatatagag	18240
accttgacctg acaaagatac tatagagaag ctagaggaat tggcagccat cttatcgatg	18300
gctctgctcc tgggcaaaat aggatcaata ctggtgatta agcttatgcc tttcagcggg	18360
gattttgttc agggatttat aagttatgta gggcttcatt atagagaagt gaaccttgta	18420
taccctagat acagcaactt catctctact gaatcttatt tggttatgac agatctcaag	18480
gctaaccggc taatgaatcc tgaaaagatt aagcagcaga taattgaatc atctgtgagg	18540
acttcacctg gacttatagg tcacatccta tccattaagc aactaagctg catacaagca	18600
attgtgggag acgcagttag tagaggatgat atcaatccta ctctgaaaaa acttacacct	18660
atagagcagg tgctgatcaa ttgcgggttg gcaattaacg gacctagct gtgcaaagaa	18720
ttgatccacc atgatgttgc ctcagggcaa gatggattgc ttaattctat actcatcctc	18780

tacagggagt	tggcaagatt	caaagacaac	caaagaagtc	aacaagggat	gttccacgct	18840
taccccgtat	tggtaaagtag	caggcaacga	gaacttatat	ctaggatcac	ccgcaaattc	18900
tgggggcaca	ttcttcttta	ctccgggaac	aaaaagttga	taaataagtt	tatccagaat	18960
ctcaagtccg	gctatctgat	actagactta	caccagaata	tcttcgttaa	gaatctatcc	19020
aagtcagaga	aacagattat	tatgacgggg	ggtttgaaac	gtgagtgggt	ttttaaggta	19080
acagtcaagg	agaccaaaga	atggtataag	ttagtcggat	acagtgccct	gattaaggac	19140
taattggttg	aactccggaa	ccctaatacct	gccctaggtg	gttaggcatt	atttgcaata	19200
tattaaagaa	aactttgaaa	atacgaagtt	tctattccca	gctttgtctg	gtggccggca	19260
tgggtcccagc	ctcctcgctg	gcgccggctg	ggcaacattc	cgaggggacc	gtcccctcgg	19320
taatggcgaa	tgggacgcgg	ccgatccggc	tgctaacaaa	gcccgaagg	aagctgagtt	19380
ggctgctgcc	accgctgagc	aataactagc	ataaccctt	ggggcctcta	aacgggtctt	19440
gaggggtttt	ttgctgaaag	gaggaactat	atccggatgc	ggccgcgggc	cctatggtac	19500
ccagcttttg	ttccctttag	tgagggttaa	ttccgagctt	ggcgtaatca	tggtcatagc	19560
tgtttcctgt	gtgaaattgt	tatccgctca	caattccaca	caacatagga	gccggaagca	19620
taaagtgtaa	agcctggggg	gcctaatagag	tgaggtaact	cacattaatt	gcgttgcgct	19680
cactgcccgc	tttccagtcg	ggaaacctgt	cgtgccagct	gcattaatga	atcggccaac	19740
gcgcggggag	aggcggtttg	cgtattgggc	gctcttccgc	ttcctcgctc	actgactcgc	19800
tgcgctcggg	cgttcggctg	cggcgagcgg	tatcagctca	ctcaaaggcg	gtaatacggg	19860
tatccacaga	atcaggggat	aacgcaggaa	agaacatgtg	agcaaaaggc	cagcaaaagg	19920
ccaggaaccg	taaaaaggcc	gcgttgctgg	cgtttttcca	taggctcggc	ccccctgacg	19980
agcatcacia	aaatcgacgc	tcaagtcaga	ggtggcgaaa	cccgacagga	ctataaagat	20040
accaggcggt	ccccctgga	agctccctcg	tgcgctctcc	tgttccgacc	ctgccgctta	20100
ccggatacct	gtccgccttt	ctcccttcgg	gaagcgtggc	gctttctcaa	tgctcacgct	20160
gtaggtatct	cagttcgggtg	taggtcggtc	gctccaagct	gggctgtgtg	cacgaacccc	20220
ccgttcagcc	cgaccgctgc	gccttatccg	gtaactatcg	tcttgagtcc	aaccggttaa	20280
gacacgactt	atgccactg	gcagcagcca	ctggtaacag	gattagcaga	gcgaggtatg	20340
taggcggtgc	tacagagttc	ttgaagtggg	ggcctaacta	cggctacact	agaaggacag	20400

tatttggtat ctgcgctctg ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt	20460
gatccggcaa acaaaccacc gctggtagcg gtgggtttttt tgtttgcaag cagcagatta	20520
cgcgcagaaa aaaaggatct caagaagatc ctttgatctt ttctacgggg tctgacgctc	20580
agtggaacga aaactcacgt taagggattt tggtcatgag attatcaaaa aggatcttca	20640
cctagatcct tttaaattaa aaatgaagtt ttaaataaat ctaaagtata tatgagtaaa	20700
cttggcttga cagttaccaa tgcttaatca gtgaggcacc tatctcagcg atctgtctat	20760
ttcgttcac catagttgcc tgactgcccg tcgtgtagat aactacgata cgggagggct	20820
taccatctgg cccagtgct gcaatgatac cgcgagacc acgctcacc gctccagatt	20880
tatcagcaat aaaccagcca gccggaaggg ccgagcgcag aagtggtcct gcaactttat	20940
ccgcctccat ccagtctatt aattgttgcc gggaagctag agtaagtagt tcgccagtta	21000
atagtttgcg caacgttggt gccattgcta caggcatcgt ggtgtcacgc tcgtcgtttg	21060
gtatggcttc attcagctcc ggttcccaac gatcaaggcg agttacatga tccccatgt	21120
tgtgaaaaaa agcgggttagc tccttcggtc ctccgatcgt tgtcagaagt aagttggccg	21180
cagtgttatc actcatgctt atggcagcac tgcataattc tcttactgtc atgccatccg	21240
taagatgctt ttctgtgact ggtgagtact caaccaagtc attctgagaa tagtgtatgc	21300
ggcgaccgag ttgctcttgc ccggcgtcaa tacgggataa taccgcgcca catagcagaa	21360
ctttaaaagt gctcatcatt ggaaaacgtt cttcggggcg aaaactctca aggatcttac	21420
cgctgttgag atccagttcg atgtaacca ctcgtgcacc caactgatct tcagcatctt	21480
ttactttcac cagcgtttct gggtgagcaa aaacaggaag gcaaaatgcc gcaaaaaagg	21540
gaataagggc gacacggaaa tgttgaatac tcatactctt cttttttcaa tattattgaa	21600
gcatttatca gggttattgt ctcagtagcg gatacatatt tgaatgtatt tagaaaaata	21660
aacaaatagg ggttccgcgc acatttcccc gaaaagtgcc acctgaaatt gtaaacttta	21720
atattttgtt aaaattcgcg ttaaattttt gttaaatacag ctcatTTTTT aaccaatagg	21780
ccgaaatcgg caaaatccct tataaatcaa aagaatagac cgagataggg ttgagtgttg	21840
ttccagtttg gaacaagagt ccactattaa agaacgtgga ctccaacgtc aaagggcgaa	21900
aaaccgtcta tcagggcgat ggcccactac gtgaaccatc accctaata agtttttttg	21960
ggtcgaggtg ccgtaaagca ctaaatacga accctaaagg gagccccga tttagagctt	22020

gacggggaaa gccggcgaac gtggcgagaa aggaagggaa gaaagcgaaa ggagcgggcg 22080
ctagggcgct ggcaagtgtg gcggtcacgc tgcgcgtaac caccacaccc gccgcgctta 22140
atgcgccgct acagggcgcg tcccattcgc cattcaggct gcgcaactgt tgggaagggc 22200
gatcgggtgcg ggcctcttcg ctattacgcc agccaccgcg gtg 22243

<210> 150
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide HBSP A2-2

<400> 150

Thr Leu Cys Ile Pro His Val Ala Val
1 5

<210> 151
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic peptide Sv B7-3

<400> 151

Ser Pro Phe Leu Pro Leu Leu Pro Ile
1 5

<210> 152
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic furin sites

<400> 152

Arg Arg Asp Lys Arg
1 5