

2013001905
SEQUENCE LISTING

<110> CUREVAC GMBH

<120> Nucleic acid comprising or coding for a histone stem-loop and a poly(A) sequence or a polyadenylation signal for increasing the expression of an encoded tumour antigen

<130> CU01P128WO1

<140> PCT/EP2012/000674

<141> 2012-02-15

<160> 58

<170> PatentIn version 3.5

<210> 1

<211> 16

<212> RNA

<213> artificial

<220>

<223> histone stem-loop sequence according to formula (Ic): metazoan and protozoan histone stem-loop consensus sequence without stem bordering elements

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<222> (1)..(1)

<223> n is selected from a nucleotide selected from A, U, T, G and C, or a nucleotide analogue thereof

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<400> 1
ngnnnnnnun nnnncn

16

<210> 2

<211> 26

<212> RNA

<213> artificial

<220>

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<400> 2
 nnnnnngnnn nnnunnnnnc nnnnnn

26

<210> 3
 <211> 16
 <212> RNA
 <213> artificial

<220>
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 stem bordering elements

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<400> 3
 ncnnnnnnun nnnngn

16

<210> 4
 <211> 26
 <212> RNA

<213> artificial

<220>

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nnnnnnncnnn nnnunnnnnng nnnnnn

26

<210> 5

<211> 16

<212> RNA

<213> artificial

<220>

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<400> 5

dgnnnnnnnun nnnnch

16

<210> 6

<211> 26

<212> RNA

<213> artificial

<220>

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histone stem-loop consensus sequence with stem bordering elements

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<400> 6

nnnnndgnnn nnnunnnnnc hnnnnn

26

<210> 7

<211> 16

<212> RNA

<213> artificial

<220>

<223> histone stem-loop sequence according to formula (If): metazoan
histone stem-loop consensus sequence without stem bordering
elements

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<220>
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<400> 7
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16

<210> 8
 <211> 26
 <212> RNA
 <213> artificial

<220>
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 histone stem-loop consensus sequence with stem bordering elements

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<400> 8
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<210> 9
 <211> 16
 <212> RNA
 <213> artificial

<220>
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 histone stem-loop consensus sequence without stem bordering
 elements

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<220>
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<220>
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<400> 9
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<210> 10
 <211> 26
 <212> RNA
 <213> artificial

<220>
 <223> histone stem-loop sequence according to formula (IIg): vertebrate
 histone stem-loop consensus sequence with stem bordering elements

<220>
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 <222> (1)..(2)
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<220>
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or a nucleotide analogue thereof

<220>
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<400> 10
 nnhnnngghyy ydnuhabrdc nnnnnh 26

<210> 11
 <211> 16
 <212> RNA
 <213> artificial

<220>
 <223> histone stem-loop sequence according to formula (Ih): humane
 histone stem-loop consensus sequence (Homo sapiens) without stem
 bordering elements

<400> 11
 dghycudyuh asrrcc 16

<210> 12
 <211> 26
 <212> RNA
 <213> artificial

<220>
 <223> histone stem-loop sequence according to formula (IIh): human
 histone stem-loop consensus sequence (Homo sapiens) with stem
 bordering elements

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<220>
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<400> 12
 nhaahdghyc udyuhasrrc cvhbnh 26

<210> 13
 <211> 16
 <212> DNA
 <213> artificial

<220>
 <223> histone stem-loop sequences (without stem-bordering elements)
 according to formula (Ic)

<400> 13
 vgyyyhhth rvvrcb 16

<210> 14
 <211> 16

<212> DNA
 <213> artificial

 <220>
 <223> histone stem-loop sequences (without stem-bordering elements)
 according to formula (Ic)

 <400> 14
 sgyytytym arrrcs 16

 <210> 15
 <211> 16
 <212> DNA
 <213> artificial

 <220>
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 according to formula (Ic)

 <400> 15
 sgyyctttm agrrcs 16

 <210> 16
 <211> 16
 <212> DNA
 <213> artificial

 <220>
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 according to formula (Ie)

 <220>
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 <222> (3)..(5)
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 <220>
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 or a nucleotide analogue thereof

 <220>
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 <400> 16
 dgnnnbnnth vnnch 16

 <210> 17
 <211> 16
 <212> DNA
 <213> artificial

 <220>
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 according to formula (Ie)

 <220>
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<220>
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<400> 17
 rgnnnyhbth rdncy 16

<210> 18
 <211> 16
 <212> DNA
 <213> artificial

<220>
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 according to formula (Ie)

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<220>
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 or a nucleotide analogue thereof

<400> 18
 rgndbyhyth rdhncy 16

<210> 19
 <211> 16
 <212> DNA
 <213> artificial

<220>
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 according to formula (If)

<400> 19
 vgyyytyhth rvrrcb 16

<210> 20
 <211> 16
 <212> DNA
 <213> artificial

<220>
 <223> histone stem-loop sequences (without stem-bordering elements)
 according to formula (If)

<400> 20
 sgyycttytm agrrcs 16

<210> 21
 <211> 16

<212> DNA
 <213> artificial
 <220>
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 according to formula (If)
 <400> 21
 sgyycttttm agrrcs 16

<210> 22
 <211> 16
 <212> DNA
 <213> artificial
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 according to formula (Ig)
 <400> 22
 ggyycttyth agrgcc 16

<210> 23
 <211> 16
 <212> DNA
 <213> artificial
 <220>
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 according to formula (Ig)
 <400> 23
 ggcyycttytm agrgcc 16

<210> 24
 <211> 16
 <212> DNA
 <213> artificial
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 according to formula (Ig)
 <400> 24
 ggctcttttm agrgcc 16

<210> 25
 <211> 16
 <212> DNA
 <213> artificial
 <220>
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 according to formula (Ih)
 <400> 25
 dghyctdyth asrrcc 16

<210> 26
 <211> 16
 <212> DNA
 <213> artificial

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<220>
 <223> histone stem-loop sequences (without stem-bordering elements)
 according to formula (Ih)
 <400> 26
 ggcycctttth agrgcc 16

<210> 27
 <211> 16
 <212> DNA
 <213> artificial

<220>
 <223> histone stem-loop sequences (without stem-bordering elements)
 according to formula (Ih)
 <400> 27
 ggcyccttttm agrgcc 16

<210> 28
 <211> 26
 <212> DNA
 <213> artificial

<220>
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 according to formula (Iic)

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<400> 28
 hhhhvvgyyy yhhthrvrc bvhhnn 26

<210> 29
 <211> 26
 <212> DNA
 <213> artificial

<220>
 <223> histone stem-loop sequence (with stem bordering elements)
 according to formula (Iic)

<400> 29
 mhmhmsgyyy ttytmarrrc smchhh 26

<210> 30
 <211> 26
 <212> DNA
 <213> artificial

<220>
 <223> histone stem-loop sequence (with stem bordering elements)
 according to formula (Iic)

<400> 30
 mmmmsggyyc tttmagrrc sachmh 26

<210> 31

<211> 26
 <212> DNA
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 according to formula (IIe)

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<220>
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<220>
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 or a nucleotide analogue thereof

<220>
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 <222> (24)..(26)
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<400> 31
 nnnnndgnnn bnnthvnnnc hnhnnn

26

<210> 32
 <211> 26
 <212> DNA
 <213> artificial

<220>
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 according to formula (IIe)

<220>
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 <222> (1)..(2)
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<222> (18)..(19)

<223> n is selected from a nucleotide selected from A, U, T, G and C,
or a nucleotide analogue thereof

<220>

<221> misc_feature

<222> (25)..(26)

<223> n is selected from a nucleotide selected from A, U, T, G and C,
or a nucleotide analogue thereof

<400> 32

nnhhnrgnnn yhbthrdnnc ydhhnn

26

<210> 33

<211> 26

<212> DNA

<213> artificial

<220>

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according to formula (IIe)

<220>

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<222> (19)..(19)

<223> n is selected from a nucleotide selected from A, U, T, G and C,
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<400> 33

nhhhvrngndb yhythrdhnc yrhhhh

26

<210> 34

<211> 26

<212> DNA

<213> artificial

<220>

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according to formula (IIf)

<220>

<221> misc_feature
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<400> 34
 hhmhmvgyyy tyhthrvrrc bvmhnn 26

<210> 35
 <211> 26
 <212> DNA
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<220>
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 according to formula (II f)

<400> 35
 mmmmmmsgyyc ttytmagrrc smchhh 26

<210> 36
 <211> 26
 <212> DNA
 <213> artificial

<220>
 <223> histone stem-loop sequence (with stem bordering elements)
 according to formula (II f)

<400> 36
 mmmmmmsgyyc ttttmagrrc sachmh 26

<210> 37
 <211> 26
 <212> DNA
 <213> artificial

<220>
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 according to formula (II g)

<220>
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 <222> (24)..(25)
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 or a nucleotide analogue thereof

<400> 37
 hhmamggyyc ttythagrrc cvhnnm 26

<210> 38
 <211> 26
 <212> DNA
 <213> artificial

<220>
 <223> histone stem-loop sequence (with stem bordering elements)
 according to formula (II g)

<400> 38
 hhaamggcyc ttytmagrgc cvchhm 26

<210> 39
 <211> 26
 <212> DNA
 <213> artificial

 <220>
 <223> histone stem-loop sequence (with stem bordering elements)
 according to formula (IIg)

 <400> 39
 mmaamggctc tttmagrgc cmcymm 26

 <210> 40
 <211> 26
 <212> DNA
 <213> artificial

 <220>
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 according to formula (IIh)

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 <220>
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 <222> (25)..(25)
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 <400> 40
 nhaahdghyc tdythasrrc cvhbnh 26

 <210> 41
 <211> 26
 <212> DNA
 <213> artificial

 <220>
 <223> histone stem-loop sequence (with stem bordering elements)
 according to formula (IIh)

 <220>
 <221> misc_feature
 <222> (25)..(25)
 <223> n is selected from a nucleotide selected from A, U, T, G and C,
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 <400> 41
 hhaamggcyc tttthagrgc cvmynm 26

 <210> 42
 <211> 26
 <212> DNA
 <213> artificial

 <220>
 <223> histone stem-loop sequence (with stem bordering elements)
 according to formula (IIh)

<400> 42
hmaaaggcyc ttttmagrgc crmyhm

26

<210> 43
<211> 1747
<212> RNA
<213> artificial

<220>
<223> mRNA sequence of ppLuc(GC)-ag

<400> 43
gggagaaagc uugaggaugg aggacgccaa gaacaucaag aaggggcccgg cgcccuucua 60
cccgcuggag gacgggaccg ccggcgagca gcuccacaag gccaugaagc gguacgccc 120
ggugccgggc acgaucgccu ucaccgacgc ccacaucgag gucgacauca ccuacgcgga 180
guacuucgag augagcgugc gccuggccga ggccaugaag cgguacggcc ugaacaccaa 240
ccaccggau c guggugugcu cggagaacag ccugcaguuc uucaugccgg ugcugggcgc 300
ccucuucauc ggcguggccg ucgccccggc gaacgacauc uacaacgagc gggagcugcu 360
gaacagcaug gggauagacc agccgaccgu gguguucgug agcaagaagg gccugcagaa 420
gauccugaac gugcagaaga agcugcccau cauccagaag aucaucauca uggacagcaa 480
gaccgacuac cagggcuucc agucgaugua cacguucgug accagccacc ucccgccggg 540
cuucaacgag uacgacuucg ucccggagag cuucgaccgg gacaagacca ucgccugau 600
caugaacagc agcggcagca ccggccugcc gaagggggug gccugccgc accggaccgc 660
cugcgugcgc uucucgcacg cccgggaccc caucuucggc aaccagauca ucccggacac 720
cgccauccug agcguggugc cguuccacca cggcuucggc auguucacga cccugggcua 780
ccucaucugc ggcuuccggg ugguccugau guaccgguuc gaggaggagc uguuccugcg 840
gagccugcag gacuacaaga uccagagcgc gcugcucgug ccgaccugu ucagcuucuu 900
cgccaagagc acccugaucg acaaguacga ccugucgaac cugcacgaga ucgccagcgg 960
gggcgccccg cugagcaagg aggugggcga ggccguggcc aagcggguucc accucccg 1020
cauccgccag ggcuaaggcc ugaccgagac cacgagcgcg auccugauca ccccgagg 1080
ggacgacaag ccgggcgccc ugggcaaggu ggucccgauu uucgaggcca agguggugga 1140
ccuggacacc ggcaagaccc ugggcgugaa ccagcggggc gagcugugcg ugcggggg 1200
gaugaucaug agcggcuacg ugaacaaccc ggaggccacc aacgcccua ucgacaagga 1260
cggcuggcug cacagcggcg acaucgccua cugggacgag gacgagcacu ucuucaucgu 1320
cgaccggcug aagucgcuga ucaaguacaa ggcuaaccag guggcgccgg ccgagcugga 1380
gagcauccug cuccagcacc ccaacaucuu cgacgccggc guggccgggc ugccggacga 1440
cgacgccggc gagcugccgg ccgcgguggu ggugcuggag cacggcaaga ccaugacgga 1500
gaaggagauc gucgacuacg uggccagcca ggugaccacc gccagaagc ugcggggcgg 1560
cgugguguuc guggacgagg ucccgaagg ccugaccggg aagcucgacg cccggaagau 1620
ccgcgagauc cugaucaagg ccaagaaggg cggcaagauc gccguguaag acuaguuaua 1680

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agacugacua gcccgauogg ccuccaacc ggcccuccuc cccuccuugc accgagauua 1740
auagauc 1747

<210> 44
<211> 1806
<212> RNA
<213> artificial

<220>
<223> mRNA sequence of ppLuc(GC)-ag-A64

<400> 44
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ggugccgggc acgaucgcu ucaccgacgc ccacaucgag gucgacauca ccuacgcgga 180
guacuucgag augagcgugc gccuggccga ggccaugaag cgguacggcc ugaacaccaa 240
ccaccggaucc guggugugcu cggagaacag ccugcaguuc uucaugccgg ugcuggggcg 300
ccucuucac ggcguggccg ucgccccggc gaacgacauc uacaacgagc gggagcugcu 360
gaacagcaug gggauccagc agccgaccgu gguguucgug agcaagaagg gccugcagaa 420
gauccugaac gugcagaaga agcugcccau cauccagaag aucaucauca uggacagcaa 480
gaccgacuac cagggcuucc agucgaugua cacguucgug accagccacc ucccggccgg 540
cuucaacgag uacgacuucg ucccggagag cuucgaccgg gacaagacca ucgcccugau 600
caugaacagc agcggcgagc ccggccugcc gaagggggug gcccugccgc accggaccgc 660
cugcgugcg uucucgcacg cccgggaccc caucuucggc aaccagauca ucccggacac 720
cgccauccug agcggugugc cguuccacca cggcuucggc auguucacga cccugggcua 780
ccuacucugc ggcuuccggg ugguccugau guaccgguuc gaggaggagc uguuccugcg 840
gagccugcag gacuacaaga uccagagcgc gcugcucgug ccgaccugug ucagcuucuu 900
cgccaagagc acccugaucg acaaguacga ccugucgaac cugcacgaga ucgccagcgg 960
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cauccgccag ggcuacggcc ugaccgagac cacgagcgcg auccugauca cccccgagg 1080
ggacgacaag ccgggcgccc ugggcaaggu ggucccguc uucgaggcca agguggugga 1140
ccuggacacc ggcaagacc ugggcgugaa ccagcggggc gagcugugcg ugcggggggc 1200
gaugaucaug agcggcuacg ugaacaacc ggaggccacc aacgcccua ucgacaagga 1260
cggcuggcug cacagcggcg acaucgccua cugggacgag gacgagcacu ucuuacug 1320
cgaccggcug aagucgcuga ucaaguacaa gggcuaccag guggcgccgg ccgagcugga 1380
gagcauccug cuccagcacc ccaacauuu cgacgccggc guggccgggc ugccggacga 1440
cgacgccggc gagcugccgg ccgcgguggu ggugcuggag cacggcaaga ccaugacgga 1500
gaaggagaucc gucgacuacg uggccagcca ggugaccacc gccagaagc ugcggggcg 1560
cgugguguuc guggacgagg ucccgaaggg ccugaccggg aagcucgacg cccggaagau 1620

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ccgcgagauc	cugaucaagg	ccaagaaggg	cggcaagauc	gccguguaag	acuaguuaa	1680
agacugacua	gcccgauggg	ccucccaacg	ggcccuccuc	cccuccuugc	accgagauua	1740
auaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	1800
aaaaaa						1806

<210> 45
 <211> 1772
 <212> RNA
 <213> artificial

<220>
 <223> mRNA sequence of ppLuc(GC)-ag-histoneSL

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aagggcccgg	cgcccuucua
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cccgcuggag	gacgggaccg
ccggcgagca	gcuccacaag
gccaugaagc	gguacgcccc
120	
ggugccgggc	acgaucgccu
ucaccgacgc	ccacaucgag
gucgacauca	ccuacgcgga
180	
guacuucgag	augagcgugc
gccugggccga	ggccaugaag
cgguacggcc	ugaacaccaa
240	
ccaccggauc	guggugugcu
cggagaacag	ccugcaguuc
uucaugccgg	ugcugggcgc
300	
ccucucauc	ggcguggccg
ucgccccggc	gaacgacauc
uacaacgagc	gggagcugcu
360	
gaacagcaug	gggaucagcc
agccgaccgu	gguguucgug
agcaagaagg	gccugcagaa
420	
gauccugaac	gugcagaaga
agcugcccau	cauccagaag
aucaucauca	uggacagcaa
480	
gaccgacuac	cagggcuucc
agucgaugua	cacguucgug
accagccacc	ucccgccggg
540	
cuucaacgag	uacgacuucg
ucccgagag	cuucgaccgg
gacaagacca	ucgcccugau
600	
caugaacagc	agcggcagca
ccggccugcc	gaagggggug
gcccugccgc	accggaccgc
660	
cugcgugcgc	uucucgcacg
cccgggaccc	caucuucggc
aaccagauca	ucccgacac
720	
cgccauccug	agcguggugc
cguuccacca	cggcuucggc
auguucacga	cccugggcua
780	
ccucaucugc	ggcuuccggg
ugguuccugau	guaccggguuc
gaggaggagc	uguuccugcg
840	
gagccugcag	gacuacaaga
uccagagcgc	gcugcucgug
ccgaccugug	ucagcuucuu
900	
cgccaagagc	accugaucg
acaaguacga	ccugucgaac
cugcacgaga	ucgccagcgg
960	
gggcgccccg	cugagcaagg
aggugggcca	ggccguggcc
aagcgggucc	accucccggg
1020	
cauccgccag	ggcuacggcc
ugaccgagac	cacgagcgcg
auccugauca	cccccgaggg
1080	
ggacgacaag	ccgggcgccc
ugggcaaggu	ggucccgguuc
uucgaggcca	agguggugga
1140	
ccuggacacc	ggcaagaccc
ugggcgugaa	ccagcggggc
gagcugugcg	ugcggggggc
1200	
gaugaucaug	agcggcuacg
ugaacaaccc	ggaggccacc
aacgcccua	ucgacaagga
1260	
cggcuggcug	cacagcggcg
acaucgccua	cugggacgag
gacgagcacu	ucuucaucgu
1320	
cgaccggcug	aagucgcuga
ucaaguacaa	gggcuaccag
guggcgccgg	ccgagcugga
1380	
gagcauccug	cuccagcacc
ccaacaucuu	cgacgccggc
guggccgggc	ugccggacga
1440	
cgacgccggc	gagcugccgg
ccgcgguggu	ggugcuggag
cacggcaaga	ccaugacgga
1500	

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gaaggagauc	gucgacuacg	uggccagcca	ggugaccacc	gccaagaagc	ugcggggcgg	1560
cgugguguuc	guggacgagg	ucccgaaggg	ccugaccggg	aagcucgacg	cccggaagau	1620
ccgcgagauc	cugaucaagg	ccaagaaggg	cggcaagauc	gccguguaag	acuaguuaa	1680
agacugacua	gcccgauggg	ccucccaacg	ggcccuccuc	cccuccuugc	accgagauua	1740
auagaucuca	aaggcucuuu	ucagagccac	ca			1772

<210> 46
 <211> 1835
 <212> RNA
 <213> artificial

<220>
 <223> mRNA sequence of ppLuc(GC)-ag-A64-histoneSL

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aggacgccaa	gaacaucaag
aagggcccgg	cgcccuucua
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cccgcuggag	gacgggaccg
ccggcgagca	gcuccacaag
gccaugaagc	gguacgcccu
	120
ggugccgggc	acgaucgccu
ucaccgacgc	ccacaucgag
gucgacauca	ccuacgcgga
	180
guacuucgag	augagcgugc
gccuggccga	ggccaugaag
cgguacggcc	ugaacaccaa
	240
ccaccggau	c
guggugugcu	cggagaacag
ccugcaguuc	uucaugccgg
ugcugggcgc	
	300
ccucuuc	auc
ggcguggccg	ucgccccggc
gaacgacauc	uacaacgagc
gggagcugcu	
	360
gaacagcaug	gggaucagcc
agccgaccgu	gguguucgug
agcaagaagg	gccugcagaa
	420
gauccugaac	gugcagaaga
agcugcccau	cauccagaag
aucaucauca	uggacagcaa
	480
gaccgacuac	cagggcuucc
agucgaugua	cacguucgug
accagccacc	ucccgccggg
	540
cuucaacgag	uacgacuucg
ucccgagag	cuucgaccgg
gacaagacca	ucgcccugau
	600
caugaacagc	agcggcagca
ccggccugcc	gaagggggug
gcccugccgc	accggaccgc
	660
cugcgugcgc	uucucgcacg
cccgggaccc	caucuucggc
aaccagauca	ucccggaac
	720
cgccauccug	agcguggugc
cguuccacca	cggcuucggc
auguucacga	cccugggcua
	780
ccucaucugc	ggcuuccggg
ugguuccgau	guaccgguuc
gaggaggagc	uguuccugcg
	840
gagccugcag	gacuacaaga
uccagagcgc	gcugcucgug
ccgaccugug	ucagcuucuu
	900
cgccaagagc	accugaucg
acaaguacga	ccugucgaac
cugcacgaga	ucgccagcgg
	960
gggcgccccg	cugagcaagg
aggugggcga	ggccguggcc
aagcgggucc	accucccggg
	1020
cauccgccag	ggcuacggcc
ugaccgagac	cacgagcgcg
auccugauca	cccccgaggg
	1080
ggacgacaag	ccgggcgccc
ugggcaaggu	ggucccgguuc
uucgaggcca	agguggugga
	1140
ccuggacacc	ggcaagaccc
ugggcgugaa	ccagcggggc
gagcugugcg	ugcggggggc
	1200
gaugaucaug	agcggcuacg
ugaacaaccc	ggaggccacc
aacgcccuca	ucgacaagga
	1260
cggcuggcug	cacagcggcg
acaucgccua	cugggacgag
gacgagcacu	ucuucaucgu
	1320
cgaccggcug	aagucgcuga
ucaaguacaa	gggcuaccag
guggcgccgg	ccgagcugga
	1380
gagcauccug	cuccagcacc
ccaacaucuu	cgacgccggc
guggccgggc	ugccggacga
	1440

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cgacgccggc	gagcugccgg	ccgcgguggu	ggugcuggag	cacggcaaga	ccaugacgga	1500
gaaggagauc	gucgacuacg	uggccagcca	ggugaccacc	gccaagaagc	ugcggggcgg	1560
cgugguguuc	guggacgagg	ucccgaaggg	ccugaccggg	aagcucgacg	cccggaagau	1620
ccgcgagauc	cugaucaagg	ccaagaaggg	cggcaagauc	gccguguaag	acuaguuaa	1680
agacugacua	gcccgauggg	ccucccaacg	ggcccuccuc	cccuccuugc	accgagauua	1740
auaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	1800
aaaaaaugca	ucaaaggcuc	uuuucagagc	cacca			1835

<210> 47
 <211> 1869
 <212> RNA
 <213> artificial

<220>
 <223> mRNA sequence of ppLuc(GC)-ag-A120

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aagggcccgg	cgcccuucua
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ccggcgagca	gcuccacaag
gccaugaagc	gguacgcccu
120	
ggugccgggc	acgaucgccu
ucaccgacgc	ccacaucgag
gucgacauca	ccuacgcgga
180	
guacuucgag	augagcgugc
gccuggccga	ggccaugaag
cgguacggcc	ugaacaccaa
240	
ccaccggauc	guggugugcu
cggagaacag	ccugcaguuc
uucaugccgg	ugcuggggcg
300	
ccucuucauc	ggcguggccg
ucgccccggc	gaacgacauc
uacaacgagc	gggagcugcu
360	
gaacagcaug	gggaucagcc
agccgaccgu	gguguucgug
agcaagaagg	gccugcagaa
420	
gauccugaac	gugcagaaga
agcugcccau	cauccagaag
aucaucauca	uggacagcaa
480	
gaccgacuac	cagggcuucc
agucgaugua	cacguucgug
accagccacc	ucccgccggg
540	
cuucaacgag	uacgacuucg
ucccgagag	cuucgaccgg
gacaagacca	ucgcccugau
600	
caugaacagc	agcggcagca
ccggccugcc	gaagggggug
gcccugccgc	accggaccgc
660	
cugcgugcgc	uucucgcacg
cccgggaccc	caucuucggc
aaccagauca	ucccgacac
720	
cgccauccug	agcguggugc
cguuccacca	cggcuucggc
auguucacga	cccugggcua
780	
ccucaucugc	ggcuuccggg
ugguuccugau	guaccgguuc
gaggaggagc	uguuccugcg
840	
gagccugcag	gacuacaaga
uccagagcgc	gcugcucgug
ccgaccugug	ucagcuucuu
900	
cgccaagagc	accugaucg
acaaguacga	ccugucgaac
cugcacgaga	ucgccagcgg
960	
gggcgccccg	cugagcaagg
agguggggcg	ggccguggcc
aagcgggucc	accucccggg
1020	
cauccgccag	ggcuacggcc
ugaccgagac	cacgagcgcg
auccugauca	ccccgagggg
1080	
ggacgacaag	ccgggcgccg
ugggcaaggu	ggucccgguuc
uucgaggcca	agguggugga
1140	
ccuggacacc	ggcaagaccc
ugggcgugaa	ccagcggggc
gagcugugcg	ugcggggggc
1200	
gaugaucaug	agcggcuacg
ugaacaaccc	ggaggccacc
aacgcccuca	ucgacaagga
1260	
cggcuggcug	cacagcggcg
acaucgccua	cugggacgag
gacgagcacu	ucuucaucgu
1320	

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cgaccggcug	aagucgcuga	ucaaguacaa	gggcuaccag	guggcgccgg	ccgagcugga	1380
gagcauccug	cuccagcacc	ccaacauuu	cgacgccggc	guggccgggc	ugccggacga	1440
cgacgccggc	gagcugccgg	ccgcgguggu	ggugcuggag	cacggcaaga	ccaugacgga	1500
gaaggagauc	gucgacuacg	uggccagcca	ggugaccacc	gccaagaagc	ugcggggcgg	1560
cgugguguuc	guggacgagg	ucccggaagg	ccugaccggg	aagcucgacg	cccggaagau	1620
ccgcgagauc	cugaucaagg	ccaagaaggg	cggcaagauc	gccguguaag	acuaguuaua	1680
agacugacua	gcccgauggg	ccucccaacg	ggcccuccuc	cccuccuugc	accgagauua	1740
auagaucuaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	1800
aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	1860
aaaaaaaaaa						1869

<210> 48
 <211> 1858
 <212> RNA
 <213> artificial

<220>
 <223> mRNA sequence of ppLuc(GC)-ag-A64-ag

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aagggcccgg	cgcccuucua
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cccgcuggag	gacgggaccg
ccggcgagca	gcuccacaag
gccaugaagc	gguacgcccu
120	
ggugccgggc	acgaucgccu
ucaccgacgc	ccacaucgag
gucgacauca	ccuacgcgga
180	
guacuucgag	augagcgugc
gccuggccga	ggccaugaag
cgguacggcc	ugaacaccaa
240	
ccaccggauc	guggugugcu
cggagaacag	ccugcaguuc
uucaugccgg	ugcugggcgc
300	
ccucuucauc	ggcguggccg
ucgccccggc	gaacgacauc
uacaacgagc	gggagcugcu
360	
gaacagcaug	gggaucagcc
agccgaccgu	gguguucgug
agcaagaagg	gccugcagaa
420	
gauccugaac	gugcagaaga
agcugcccau	cauccagaag
aucaucauca	uggacagcaa
480	
gaccgacuac	cagggcuucc
agucgaugua	cacguucgug
accagccacc	ucccgccggg
540	
cuucaacgag	uacgacuucg
ucccgagag	cuucgaccgg
gacaagacca	ucgcccugau
600	
caugaacagc	agcggcgagc
ccggccugcc	gaagggggug
gcccugccgc	accggaccgc
660	
cugcgugcgc	uucucgcacg
cccgggaccc	caucuucggc
aaccagauca	ucccggaac
720	
cgccauccug	agcguggugc
cguuccacca	cggcuucggc
auguucacga	cccugggcua
780	
ccucaucugc	ggcuuccggg
ugguuccugau	guaccgguuc
gaggaggagc	uguuccugcg
840	
gagccugcag	gacuacaaga
uccagagcgc	gcugcucgug
ccgaccugug	ucagcuucuu
900	
cgccaagagc	accugaucg
acaaguacga	ccugucgaac
cugcacgaga	ucgccagcgg
960	
gggcgccccg	cugagcaagg
aggugggcga	ggccguggcc
aagcgggucc	accucccggg
1020	
cauccgccag	ggcuacggcc
ugaccgagac	cacgagcgcg
auccugauca	ccccgaggg
1080	
ggacgacaag	ccgggcgccc
ugggcaaggu	ggucccgguuc
uucgaggcca	agguggugga
1140	

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ccuggacacc	ggcaagaccc	ugggcgugaa	ccagcggggc	gagcugugcg	ugcgggggcc	1200
gaugaucaug	agcggcuacg	ugaacaaccc	ggaggccacc	aacgcccuca	ucgacaagga	1260
cggcuggcug	cacagcggcg	acaucgccua	cugggacgag	gacgagcacu	ucuucaucgu	1320
cgaccggcug	aagucgcuga	ucaaguacaa	gggcuaccag	guggcgccgg	ccgagcugga	1380
gagcauccug	cuccagcacc	ccaacaucuu	cgacgccggc	guggccgggc	ugccggacga	1440
cgacgccggc	gagcugccgg	ccgcgguggu	ggugcuggag	cacggcaaga	ccaugacgga	1500
gaaggagauc	gucgacuacg	uggccagcca	ggugaccacc	gccaagaagc	ugcggggcgg	1560
cgugguguuc	guggacgagg	ucccgaaggg	ccugaccggg	aagcucgacg	cccggaagau	1620
ccgcgagauc	cugaucaagg	ccaagaaggg	cggcaagauc	gccguguaag	acuaguuaa	1680
agacugacua	gcccgauggg	ccucccaacg	ggcccuccuc	cccuccuugc	accgagauua	1740
auaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	1800
aaaaaaugca	uccugcccga	ugggccuccc	aacgggcccu	ccuccccucc	uugcacccg	1858

<210> 49
 <211> 1894
 <212> RNA
 <213> artificial

<220>
 <223> mRNA sequence of ppLuc(GC)-ag-A64-aCPSL

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uuca	60
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ccggcgagc	gcuccaca
agcc	gccauga
agc	gguacgccc
uuca	120
ggugccgggc	acgaucgcc
ucaccgacg	ccacaucg
ag	gucgacau
ca	ccuacgcgg
uuca	180
guacuucgag	augagcgug
gccuggccg	ggccauga
ag	cgguacggc
uuca	240
ccaccggau	c
guggugugc	cggagaac
ag	ccugcagu
uuca	uucaugccg
uuca	ugcugggcg
uuca	300
ccucuuc	g
ggcguggcc	ucgccccg
g	gaacgaca
u	uacaacgag
g	gggagcugc
uuca	360
gaacagca	gggaucag
agccgaccg	gguguucg
ag	agcaagaag
g	gccugcaga
uuca	420
gauccuga	gugcaga
ag	agcugccca
uuca	cauccaga
uuca	aucaucau
uuca	uggacagca
uuca	480
gaccgacu	cagggcuuc
agucgaug	acacguucg
uuca	accagccac
uuca	ucccgccgg
uuca	540
cuucaacg	uacgacuuc
u	ucccgagag
uuca	cuucgaccg
uuca	gacaagacc
uuca	ucgcccug
uuca	600
caugaacag	agcggcagc
ccggccugc	gaagggggg
u	gccugccgc
uuca	accggaccg
uuca	660
cugcgugcg	uucucgcac
cccgggacc	caucuucgg
uuca	aaccagau
uuca	ucccgga
uuca	720
cgccauccg	agcguggug
cguuccacca	cggcuucgg
uuca	auguucacg
uuca	cccugggcua
uuca	780
ccucaucug	ggcuuccggg
u	ugguccug
uuca	guaccgguu
uuca	gaggaggag
uuca	uguuccugc
uuca	840
gagccugc	gacuaca
uuca	uccagagcg
uuca	gcugcucg
uuca	ccgaccugu
uuca	ucagcuucu
uuca	900
cgccaagag	accugaucg
uuca	acaaguacg
uuca	ccugucga
uuca	cugcacgag
uuca	ucgccagcg
uuca	960
gggcgcccc	cugagcaag
uuca	aggugggcg
uuca	ggccguggc
uuca	aagcgguuc
uuca	accuccggg
uuca	1020

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cauccgccag	ggcuacggcc	ugaccgagac	cacgagcgcg	auccugauca	ccccgaggg	1080
ggacgacaag	ccgggcgccg	ugggcaaggu	ggucccgguu	uucgaggcca	agguggugga	1140
ccuggacacc	ggcaagaccc	ugggcgugaa	ccagcggggc	gagcugugcg	ugcggggggc	1200
gaugaucaug	agcggcuacg	ugaacaaccc	ggaggccacc	aacgcccua	ucgacaagga	1260
cggcuggcug	cacagcgggc	acaucgccua	cugggacgag	gacgagcacu	ucuucaucgu	1320
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gagcauccug	cuccagcacc	ccaacaucuu	cgacgccggc	guggccgggc	ugccggacga	1440
cgacgccggc	gagcugccgg	ccgcgguggu	ggugcuggag	cacggcaaga	ccaugacgga	1500
gaaggagauc	gucgacuacg	uggccagcca	ggugaccacc	gccaagaagc	ugcggggcg	1560
cgugguguu	guggacgagg	ucccgagg	ccugaccggg	aagcucgacg	cccggagau	1620
ccgcgagauc	cugaucaagg	ccaagaagg	cggcaagauc	gccguguaag	acuaguuaa	1680
agacugacua	gcccgauggg	ccucccaacg	ggcccuccuc	cccuccuugc	accgagauua	1740
auaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	1800
aaaaaaugca	ucaauuccua	cacgugaggc	gcugugauuc	ccuauccccc	uucauucccu	1860
auacauuagc	acagcgccau	ugcauguagg	aaau			1894

<210> 50
 <211> 1909
 <212> RNA
 <213> artificial

<220>
 <223> mRNA sequence of ppLuc(GC)-ag-A64-PolioCL

<400> 50	
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aggacgccaa	gaacaucaag
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60	
cccgcuggag	gacgggaccg
ccggcgagca	gcuccacaag
gccaugaagc	gguacgccc
120	
ggugccgggc	acgaucgccu
ucaccgacgc	ccacaucgag
gucgacauca	ccuacgcgga
180	
guacuucgag	augagcgugc
gccuggccga	ggccaugaag
cgguacggcc	ugaacaccaa
240	
ccaccggauc	guggugugcu
cggagaacag	ccugcaguuc
uucaugccgg	ugcugggcgc
300	
ccucuucauc	ggcgugggcc
ucgccccggc	gaacgacauc
uacaacgagc	gggagcugcu
360	
gaacagcaug	gggaucagcc
agccgaccgu	gguguucgug
agcaagaagg	gccugcagaa
420	
gauccugaac	gugcagaaga
agcugccc	cauccagaag
aucaucauca	uggacagcaa
480	
gaccgacuac	cagggcuucc
agucgaugua	cacguucgug
accagccacc	ucccgccggg
540	
cuucaacgag	uacgacuucg
ucccgagag	cuucgaccgg
gacaagacca	ucgcccugau
600	
caugaacagc	agcggcagca
ccggccugcc	gaagggggug
gcccugccgc	accggaccgc
660	
cugcgugcgc	uucucgcacg
cccgggaccc	caucuucggc
aaccagauca	ucccgacac
720	
cgccauccug	agcggugugc
cguuccacca	cggcuucggc
auguucacga	cccugggcua
780	
ccuauucugc	ggcuuccggg
ugguuccugau	guaccgguuc
gaggaggagc	uguuccugcg
840	

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gagccugcag	gacuacaaga	uccagagcgc	gcugcucgug	ccgaccucgu	ucagcuucuu	900
cgccaagagc	accugaucg	acaaguacga	ccugucgaac	cugcacgaga	ucgccagcgg	960
gggcgccccg	cugagcaagg	agguggggcga	ggccguggcc	aagcgguucc	accucccggg	1020
cauccgccag	ggcuacggcc	ugaccgagac	cacgagcgcg	auccugauca	cccccgaggg	1080
ggacgacaag	ccgggcgccg	ugggcaaggu	ggucccguuc	uucgaggcca	agguggugga	1140
ccuggacacc	ggcaagacc	ugggcgugaa	ccagcggggc	gagcugugcg	ugcggggggc	1200
gaugaucaug	agcggcuacg	ugaacaaccc	ggaggccacc	aacgcccuca	ucgacaagga	1260
cggcuggcug	cacagcggcg	acaucgccua	cugggacgag	gacgagcacu	ucuucaucgu	1320
cgaccggcug	aagucgcuga	ucaaguacaa	gggcuaccag	guggcgccgg	ccgagcugga	1380
gagcauccug	cuccagcacc	ccaacauuu	cgacgccggc	guggccgggc	ugccggacga	1440
cgacgccggc	gagcugccgg	ccgcgguggu	ggugcuggag	cacggcaaga	ccaugacgga	1500
gaaggagauc	gucgacuacg	uggccagcca	ggugaccacc	gccaagaagc	ugcggggcgg	1560
cgugguguuc	guggacgagg	ucccgagggg	ccugaccggg	aagcucgacg	cccggaagau	1620
ccgcgagauc	cugaucaagg	ccaagaaggg	cggcaagauc	gccguguaag	acuaguuaa	1680
agacugacua	gcccgauggg	ccucccaacg	ggccuccuc	cccuccuugc	accgagauua	1740
auaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	1800
aaaaaaugca	ucaauucuaa	aacagcucug	ggguuguacc	caccccagag	gcccacgugg	1860
cggcuaguac	uccgguaauug	cgguacccuu	guacgccugu	uuuagaauu		1909

<210> 51
 <211> 1841
 <212> RNA
 <213> artificial

<220>
 <223> mRNA sequence of ppLuc(GC)-ag-A64-G30

<400> 51	
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aggacgccaa	gaacaucaag
aagggcccgg	cgcccuucua
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ccggcgagca	gcuccacaag
gccaugaagc	gguacgccc
120	
ggugccgggc	acgaucgccu
ucaccgacgc	ccacaucgag
gucgacauca	ccuacgcgga
180	
guacuucgag	augagcgugc
gccuggccga	ggccaugaag
cgguacggcc	ugaacaccaa
240	
ccaccggauc	guggugugcu
cggagaacag	ccugcaguuc
uucaugccgg	ugcugggcgc
300	
ccucuucauc	ggcguggccg
ucgccccggc	gaacgacauc
uacaacgagc	gggagcugcu
360	
gaacagcaug	gggaucagcc
agccgaccgu	gguguucgug
agcaagaagg	gccugcagaa
420	
gauccugaac	gugcagaaga
agcugcccau	cauccagaag
aucaucauca	uggacagcaa
480	
gaccgacuac	cagggcuucc
agucgaugua	cacguucgug
accagccacc	ucccgccggg
540	
cuucaacgag	uacgacuucg
ucccgagag	cuucgaccgg
gacaagacca	ucgcccugau
600	
caugaacagc	agcggcagca
ccggccugcc	gaagggggug
gcccugccgc	accggaccgc
660	

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cugcgugcgc	uucucgcacg	cccgggaccc	caucuucggc	aaccagauca	ucccggaacac	720
cgccauccug	agcguggugc	cguuccacca	cgguucggc	auguucacga	cccugggcu	780
ccucaucugc	ggcuuccggg	ugguccugau	guaccggguuc	gaggaggagc	uguuccugcg	840
gagccugcag	gacuacaaga	uccagagcgc	gcugcucgug	ccgaccugug	ucagcuucuu	900
cgccaagagc	accugaucg	acaaguacga	ccugucgaac	cugcacgaga	ucgccagcgg	960
gggcgccccg	cugagcaagg	agguggggcg	ggccguggcc	aagcgggucc	accucccggg	1020
cauccgccag	ggcuacggcc	ugaccgagac	cacgagcgcg	auccugauca	cccccgaggg	1080
ggacgacaag	ccgggcgccg	ugggcaaggu	ggucccgguuc	uucgaggcca	agguggugga	1140
ccuggacacc	ggcaagacc	ugggcgugaa	ccagcggggc	gagcugugcg	ugcggggggc	1200
gaugaucaug	agcggcuacg	ugaacaaccc	ggaggccacc	aacgcccua	ucgacaagga	1260
cggcuggcug	cacagcggcg	acaucgccua	cugggacgag	gacgagcacu	ucuucaucgu	1320
cgaccggcug	aagucgcuga	ucaaguacaa	gggcuaccag	guggcgccgg	ccgagcugga	1380
gagcauccug	cuccagcacc	ccaacaucuu	cgacgccggc	guggccgggc	ugccggacga	1440
cgacgccggc	gagcugccgg	ccgcgguggu	ggugcuggag	cacggcaaga	ccaugacgga	1500
gaaggagauc	gucgacuacg	uggccagcca	ggugaccacc	gccaagaagc	ugcggggcg	1560
cgugguguuc	guggacgagg	ucccggaagg	ccugaccggg	aagcucgacg	cccggaagau	1620
ccgcgagauc	cugaucaagg	ccaagaagg	cggcaagauc	gccguguaag	acuaguuaua	1680
agacugacua	gcccgauggg	ccucccaacg	ggccuccuc	cccuccuugc	accgagauua	1740
auaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	1800
aaaaaavgca	uggggggggg	gggggggggg	gggggggggg	g		1841

<210> 52
 <211> 1841
 <212> RNA
 <213> artificial

<220>
 <223> mRNA sequence of ppLuc(GC)-ag-A64-U30

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aggacgcca	gaacauca
aagggccc	cgcccuuc
uua	60
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ccggcgag	gcuccaca
gccauga	gguacgcc
cu	120
ggugccggg	acgaucgc
ucaccgac	ccacaucg
gucgacau	ccuacgcg
ga	180
guacuucgag	augagcgug
gccuggcc	ggccauga
cgguacgg	ugaacacca
aa	240
ccaccggau	guggugug
cggagaac	ccugcagu
uucaugcc	ugcugggc
gc	300
ccucuuc	ggcguggcc
ucgccccg	gaacgacu
uacaacga	gggagcug
cu	360
gaacagcaug	gggaucag
agccgacc	gguguucg
agcaaga	gccugcag
aa	420
gauccuga	gugcaga
agcugccc	cauccaga
ag	480
gaccgacu	cagggcuuc
agucgaug	cacguucg
accagcc	ucccgccg
gg	540

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cuucaacgag	uacgacuucg	ucccgagag	cuucgaccgg	gacaagacca	ucgcccugau	600
caugaacagc	agcggcagca	ccggccugcc	gaagggggug	gcccugccgc	accggaccgc	660
cugcgugcgc	uucucgcacg	cccgggaccc	caucuucggc	aaccagauca	ucccggaac	720
cgccauccug	agcguggugc	cguuccacca	cgguucggc	auguucacga	cccugggcua	780
ccucaucugc	ggcuuccggg	ugguccugau	guaccgguuc	gaggaggagc	uguuccugcg	840
gagccugcag	gacuacaaga	uccagagcgc	gcugcucgug	ccgaccugug	ucagcuucuu	900
cgccaagagc	accugaucg	acaaguacga	ccugucgaac	cugcacgaga	ucgccagcgg	960
gggcgccccg	cugagcaagg	aggugggcca	ggccguggcc	aagcgguucc	accucccggg	1020
cauccgccag	ggcuacggcc	ugaccgagac	cacgagcgcg	auccugauca	ccccgaggg	1080
ggacgacaag	ccgggcgccc	ugggcaaggu	ggucccgguuc	uucgaggcca	agguggugga	1140
ccuggacacc	ggcaagaccc	ugggcgugaa	ccagcggggc	gagcugugcg	ugcggggggc	1200
gaugaucaug	agcggcuacg	ugaacaaccc	ggaggccacc	aacgcccuca	ucgacaagga	1260
cggcuggcug	cacagcggcg	acaucgccua	cugggacgag	gacgagcacu	ucuucaucgu	1320
cgaccggcug	aagucgcuga	ucaaguacaa	gggcuaccag	guggcgccgg	ccgagcugga	1380
gagcauccug	cuccagcacc	ccaacaucuu	cgacgccggc	guggccgggc	ugccggacga	1440
cgacgccggc	gagcugccgg	ccgcgguggu	ggugcuggag	cacggcaaga	ccaugacgga	1500
gaaggagauc	gucgacuacg	uggccagcca	ggugaccacc	gccaagaagc	ugcggggcgg	1560
cgugguguuc	guggacgagg	ucccggaagg	ccugaccggg	aagcucgacg	cccggaagau	1620
ccgcgagauc	cugaucaagg	ccaagaaggg	cggcaagauc	gccguguaag	acuaguuaa	1680
agacugacua	gcccgauggg	ccucccaacg	ggcccuccuc	cccuccuugc	accgagauua	1740
aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	1800
aaaaaaugca	uuuuuuuuuu	uuuuuuuuuu	uuuuuuuuuu	u		1841

<210> 53
 <211> 1857
 <212> RNA
 <213> artificial

<220>
 <223> mRNA sequence of ppLuc(GC)-ag-A64-SL

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cccgcuggag	gacgggaccg	ccggcgagca	gcuccacaag	gccaugaagc	gguacgccc	120
ggugccgggc	acgaucgccc	ucaccgacgc	ccacaucgag	gucgacauca	ccuacgcgga	180
guacuucgag	augagcgugc	gccuggccga	ggccaugaag	cgguacggcc	ugaacaccaa	240
ccaccggauc	guggugugcu	cggagaacag	ccugcaguuc	uucaugccgg	ugcuggggcg	300
ccucuucauc	ggcguggccg	ucgccccggc	gaacgacauc	uacaacgagc	gggagcugcu	360
gaacagcaug	gggaucagcc	agccgaccgu	gguguucgug	agcaagaagg	gccugcagaa	420

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gauccugaac	gugcagaaga	agcugcccau	cauccagaag	aucaucauca	uggacagcaa	480
gaccgacuac	cagggcuucc	agucgaugua	cacguucgug	accagccacc	ucccgccggg	540
cuucaacgag	uacgacuucg	ucccgagag	cuucgaccgg	gacaagacca	ucgcccugau	600
caugaacagc	agcggcagca	ccggccugcc	gaagggggug	gcccugccgc	accggaccgc	660
cugcgugcgc	uucucgcacg	cccgggaccc	caucuucggc	aaccagauca	ucccggaac	720
cgccauccug	agcguggugc	cguccacca	cgguucggc	auguucacga	cccugggcua	780
ccucaucugc	ggcuuccggg	ugguccugau	guaccgguuc	gaggaggagc	uguuccugcg	840
gagccugcag	gacuacaaga	uccagagcgc	gcugcucgug	ccgaccugug	ucagcuucuu	900
cgccaagagc	accugaucg	acaaguacga	ccugucgaac	cugcacgaga	ucgccagcgg	960
ggcgccccg	cugagcaagg	aggugggcca	ggccguggcc	aagcgguucc	accucccggg	1020
cauccgccag	ggcuacggcc	ugaccgagac	cacgagcgcg	auccugauca	ccccgaggg	1080
ggacgacaag	ccggcgccg	ugggcaaggu	ggucccgguuc	uucgaggcca	agguggugga	1140
ccuggacacc	ggcaagaccc	ugggcgugaa	ccagcggggc	gagcugugcg	ugcgggggcc	1200
gaugaucaug	agcggcuacg	ugaacaaccc	ggaggccacc	aacgcccua	ucgacaagga	1260
cggcuggcug	cacagcggcg	acaucgccua	cugggacgag	gacgagcacu	ucuucaucgu	1320
cgaccggcug	aagucgcuga	ucaaguacaa	gggcuaccag	guggcgccgg	ccgagcugga	1380
gagcauccug	cuccagcacc	ccaacaucuu	cgacgccggc	guggccgggc	ugccggacga	1440
cgacgccggc	gagcugccgg	ccgcgguggu	ggugcuggag	cacggcaaga	ccaugacgga	1500
gaaggagauc	gucgacuacg	uggccagcca	ggugaccacc	gccaagaagc	ugcgggggcg	1560
cgugguguuc	guggacgagg	ucccgagggg	ccugaccggg	aagcucgacg	cccggaagau	1620
ccgcgagauc	cugaucaagg	ccaagaaggg	cggaagauc	gccguguaag	acuaguuaa	1680
agacugacua	gcccgauggg	ccucccaacg	ggcccuccuc	cccuccuugc	accgagauua	1740
auaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	1800
aaaaaaugca	uuauggcggc	cguguccacc	acggauauca	ccguggugga	cgcgggcc	1857

<210> 54
 <211> 1838
 <212> RNA
 <213> artificial

<220>
 <223> ppLuc(GC)-ag-A64-N32

<400> 54	gggagaaagc	uugaggau	aggacgcaa	gaacaucaag	aagggcccgg	cgcccuucua	60
	cccguggag	gacgggaccg	ccggcgagca	gcuccacaag	gccaugaagc	gguacgccc	120
	ggugccgggc	acgaucgccu	ucaccgacgc	ccacaucgag	gucgacauca	ccuacgcgga	180
	guacuucgag	augagcgugc	gccuggccga	ggccaugaag	cgguacggcc	ugaacaccaa	240
	ccaccggauc	guggugugcu	cggagaacag	ccugcaguuc	uucaugccgg	ugcuggggcg	300

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ccucuucauc	ggcguggccg	ucgccccggc	gaacgacauc	uacaacgagc	gggagcugcu	360
gaacagcaug	gggaucagcc	agccgaccgu	gguguucgug	agcaagaagg	gccugcagaa	420
gauccugaac	gugcagaaga	agcugcccau	cauccagaag	aucaucauca	uggacagcaa	480
gaccgacuac	cagggcuucc	agucgaugua	cacguucgug	accagccacc	ucccgccggg	540
cuucaacgag	uacgacuucg	ucccgagag	cuucgaccgg	gacaagacca	ucgcccugau	600
caugaacagc	agcggcagca	ccggccugcc	gaagggggug	gcccugccgc	accggaccgc	660
cugcgugcgc	uucucgcacg	cccgggaccc	caucuucggc	aaccagauca	ucccggaacac	720
cgccauccug	agcguggugc	cguuccacca	cgguucggc	auguucacga	cccugggcua	780
ccucaucugc	ggcuuccggg	ugguccugau	guaccgguuc	gaggaggagc	uguuccugcg	840
gagccugcag	gacuacaaga	uccagagcgc	gcugcucgug	ccgaccugug	ucagcuucuu	900
cgccaagagc	accugaucg	acaaguacga	ccugucgaac	cugcacgaga	ucgccagcgg	960
gggcgccccg	cugagcaagg	aggugggcga	ggccguggcc	aagcgguucc	accucccggg	1020
cauccgccag	ggcuacggcc	ugaccgagac	cacgagcgcg	auccugauca	ccccgagggg	1080
ggacgacaag	ccgggcgccg	ugggcaaggu	ggucccgguuc	uucgaggcca	agguggugga	1140
ccuggacacc	ggcaagaccc	ugggcgugaa	ccagcggggc	gagcugugcg	ugcggggggcc	1200
gaugaucaug	agcggcuacg	ugaacaaccc	ggaggccacc	aacgcccuca	ucgacaagga	1260
cggcuggcug	cacagcggcg	acaucgccua	cugggacgag	gacgagcacu	ucuucaucgu	1320
cgaccggcug	aagucgcuga	ucaaguacaa	gggcuaccag	guggcgccgg	ccgagcugga	1380
gagcauccug	cuccagcacc	ccaacauuu	cgacgccggc	guggccgggc	ugccggacga	1440
cgacgccggc	gagcugccgg	ccgcgguggu	ggugcuggag	cacggcaaga	ccaugacgga	1500
gaaggagauc	gucgacuacg	uggccagcca	ggugaccacc	gccaagaagc	ugcggggcg	1560
cgugguguuuc	guggacgagg	ucccggaagg	ccugaccggg	aagcucgacg	cccggaagau	1620
ccgcgagauc	cugaucaagg	ccaagaagg	cggcaagauc	gccguguaag	acuaguuaa	1680
agacugacua	gcccgauggg	ccucccaacg	ggcccuccuc	cccuccuugc	accgagauua	1740
auaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	1800
aaaaaaugca	ucccccucua	gacaauugga	auuccaua			1838

<210> 55
 <211> 747
 <212> RNA
 <213> artificial

<220>
 <223> mRNA sequence of NY-ESO-1(GC)-ag-A64-C30

<400> 55	
gggagaaagc	uuaccaugca ggccgagggc cgcggcaccg gcggcucgac cggcgacgcc 60
gacggggccc	gcggcccggg caucccgac ggcccgggcg ggaacgcggg cggcccgggc 120
gaggccggcg	ccaccggcgg gcggggcccg cggggcgccg gcgccgccg ggcgagcggc 180

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cccggcgggg gcgccccgcg gggcccgcac ggcggcgccg ccagcggccu gaacgggugc      240
ugccggugcg gcgccccgcg cccggagagc cggcuccugg aguucuaccu ggccaugccg      300
uucgcgaccc cgauggaggc cgagcuggcc cggcggagcc uggcccagga cgccccgccg      360
cugcccuguc cgggcgugcu ccugaaggag uucacgguga gcggcaacau ccugaccauc      420
cggcugaccg ccgcggacca ccggcagcug cagcugucga ucagcagcug ccuccagcag      480
cugagccugc ugauguggau caccagugc uuccugccgg uguuccuggc ccagccgccc      540
agcggccagc gccggugacc acuaguuaa agacugacua gcccgauggg ccucccaacg      600
ggccuccuc cccuccuugc accgagauua aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa      660
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaauuu ccccccccc ccccccccc      720
cccccccccc ucuagacaau uggaauu      747

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<210> 56
 <211> 761
 <212> RNA
 <213> artificial

<220>
 <223> mRNA sequence of NY-ESO-1(GC)-ag-A64-C30-histoneSL

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<400> 56
gggagaaagc uuaccaugca ggccgagggc cgcggcaccg gcggcucgac cggcgacgcc      60
gacgggcccc gcggccccgg caucccgac gggccgggcg ggaacgcggg cggccgggc      120
gaggccggcg ccaccggcg gcggggcccc cggggcgccg gcgccgcccc ggcgagcggc      180
cccggcgggg gcgccccgcg gggcccgcac ggcggcgccg ccagcggccu gaacgggugc      240
ugccggugcg gcgccccgcg cccggagagc cggcuccugg aguucuaccu ggccaugccg      300
uucgcgaccc cgauggaggc cgagcuggcc cggcggagcc uggcccagga cgccccgccg      360
cugcccuguc cgggcgugcu ccugaaggag uucacgguga gcggcaacau ccugaccauc      420
cggcugaccg ccgcggacca ccggcagcug cagcugucga ucagcagcug ccuccagcag      480
cugagccugc ugauguggau caccagugc uuccugccgg uguuccuggc ccagccgccc      540
agcggccagc gccggugacc acuaguuaa agacugacua gcccgauggg ccucccaacg      600
ggccuccuc cccuccuugc accgagauua aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa      660
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaugca ucccccccc ccccccccc      720
cccccccccc ccaaaggcuc uuuucagagc caccaggaau u      761

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<210> 57
 <211> 646
 <212> RNA
 <213> artificial

<220>
 <223> mRNA sequence of Survivin(GC)-ag-A64-C30-histoneSL

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<400> 57
gggagaaagc uuaccauggg cgccccacc cugccgcccg ccuggcagcc guuccucaag      60

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gaccaccgca ucucgaccuu caagaacugg ccguuccugg agggcugcgc gugcaccgcc	120
gagcggauug ccgaggccgg cuucauccac ugccccaccg agaacgagcc ggaccuggcc	180
cagugcuucu ucugcuucaa ggagcuggag ggcuggggagc cggacgacga cccgaucgag	240
gagcacaaga agcacagcag cggcugcgcc uuccugagcg ugaagaagca guucgaggag	300
cugacgcucg gggaguuccu gaagcuggac cgggagcggg ccaagaacaa gaucgcgaag	360
gagaccaaca acaagaagaa ggaguucgag gagaccgccca agaaggugcg gcggggccauc	420
gagcagcugg ccgccaugga cugaccacua guuauaagac ugacuagccc gauggggccuc	480
ccaacggggc cuccuccccu ccuugcaccg agauuaauaa aaaaaaaaaa aaaaaaaaaa	540
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaugcauccc cccccccccc	600
ccccccccc cccccccaa aggcucuuuu cagagccacc agaauu	646

<210> 58
 <211> 1813
 <212> RNA
 <213> artificial

<220>
 <223> mRNA sequence of MAGE-C1(GC)-ag-A64-C30-histoneSL

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