

2013001903  
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 pathogenic antigen

<130> CU01P127W01

<140> PCT/EP2012/000673

<141> 2012-02-15

<160> 56

<170> PatentIn version 3.5

<210> 1

<211> 16

<212> RNA

<213> artificial

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<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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<210> 2

<211> 26

<212> RNA

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<210> 3  
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<210> 4  
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 <212> RNA

<213> artificial

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<210> 5

<211> 16

<212> RNA

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16

<210> 6

<211> 26

<212> RNA

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26

<210> 7

<211> 16

<212> RNA

<213> artificial

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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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 nnnnnngnby ynnunvndnc nnnnnn 26

<210> 9  
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 histone stem-loop consensus sequence without stem bordering  
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 nghyydnuh abrdcn 16

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

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<210> 11  
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 <212> RNA  
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<220>  
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 histone stem-loop consensus sequence (Homo sapiens) without stem  
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<400> 11  
 dghycudyuh asrrcc 16

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

<220>  
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<400> 12  
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<210> 13  
 <211> 16  
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 <213> artificial

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 according to formula (Ic)

<400> 13  
 vgyyyhhth rvvrch 16

<210> 14  
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<212> DNA  
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 according to formula (Ic)  
 <400> 14  
 sgyytytym arrrcs 16

<210> 15  
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 according to formula (Ic)  
 <400> 15  
 sgyyctttm agrrcs 16

<210> 16  
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<400> 16  
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<210> 17  
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 according to formula (Ie)

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2013001903

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<210> 18  
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<400> 18  
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<210> 19  
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<220>  
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 according to formula (If)

<400> 19  
 vgyyytyhth rvrrcb 16

<210> 20  
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<220>  
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 according to formula (If)

<400> 20  
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<210> 21  
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<212> DNA  
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 according to formula (If)  
  
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<210> 22  
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 according to formula (Ig)  
  
 <400> 22  
 ggyycttyth agrgcc 16

<210> 23  
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 ggcyccttytm agrgcc 16

<210> 24  
 <211> 16  
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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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<400>	26 ggcyctttth 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 ggcycttttm agrgcc		16
<210>	28		
<211>	26		
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<400>	28 hhhhvvgyyy yhhthrvvrc bvhhnn		26
<210>	29		
<211>	26		
<212>	DNA		
<213>	artificial		
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<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 mmmmmsgyyc tttmagrrc sachmh		26
<210>	31		

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

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<400> 31  
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26

<210> 32  
 <211> 26  
 <212> DNA  
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2013001903

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- <400> 32  
nnhhnrgnnn yhbthrdnnc ydhhnn 26
- <210> 33  
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according to formula (IIe)
- <220>  
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- <400> 33  
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- <210> 34  
<211> 26  
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according to formula (IIf)
- <220>

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<210> 35  
 <211> 26  
 <212> DNA  
 <213> artificial

<220>  
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 according to formula (IIIf)

<400> 35  
 mmmmmmsgyyc ttytmagrrc smchhh 26

<210> 36  
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 <212> DNA  
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<220>  
 <223> histone stem-loop sequence (with stem bordering elements)  
 according to formula (IIIf)

<400> 36  
 mmmmmmsgyyc ttttmagrrc sachmh 26

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

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

<220>  
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<400> 37  
 hhmamgyyc ttythagrrc cvhnnm 26

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

<220>  
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 according to formula (IIg)

<400> 38  
 hhaamggcyc ttytmagrgc cvchhm 26

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

<220>  
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 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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<400> 40  
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<210> 41  
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 according to formula (IIh)

<220>  
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<400> 41  
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26

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

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 according to formula (IIh)

<400> 42  
hmaaaggcyc tttmagrgc crmyhm

26

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

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

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gggagaaagc uugaggauagg aggacgccaa gaacaucaag aagggcccgg 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 ccgaccugug ucagcuucuu 900  
cgccaagagc acccugaucg acaaguacga ccugucgaac cugcacgaga ucgccagcgg 960  
gggcgccccg cugagcaagg aggugggcga ggccguggcc aagcgguucc accucccggg 1020  
cauccgccag ggcuacggcc ugaccgagac cagcagcgcg auccugauca ccccgagggg 1080  
ggacgacaag ccgggcgccc ugggcaaggu ggucccgguu 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  
gaaggagau c gucgacuacg uggccagcca ggugaccacc gccagaagc ugcggggcg 1560  
cgugguguuc guggacgagg ucccgaaggg ccugaccggg aagcucgacg cccggaagau 1620  
ccgcgagau c cugaucaagg ccaagaaggg cggcaagauc gccguguaag acuaguuaua 1680



2013001903

agacugacua gcccgauggg ccucccaacg 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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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 ugcuggggcg 300  
ccucuucauc ggcguggccg ucgccccggc gaacgacauc uacaacgagc gggagcugcu 360  
gaacagcaug gggauagcc 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 agcggcagca ccggccugcc gaagggggug gccugccgc accggaccgc 660  
cugcgugcgc uucucgcacg cccgggaccc caucuucggc aaccagauca ucccggacac 720  
cgccauccug agcguggugc cguuccacca cggcuucggc auguucacga cccugggcua 780  
ccucaucugc ggcuuuccgg ugguccugau guaccgguuc gaggaggagc uguuccugcg 840  
gagccugcag gacuacaaga uccagagcgc gcugcucgug ccgaccugug ucagcuucuu 900  
cgccaagagc acccugaucg acaaguacga ccugucgaac cugcacgaga ucgccagcgg 960  
gggcgccccg cugagcaagg aggugggcca ggccguggcc aagcgguucc accucccg 1020  
cauccgccag ggcuaaggcc ugaccgagac cacgagcgcg auccugauca cccccgagg 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 gggcuaccag guggcgccgg ccgagcugga 1380  
gagcauccug cuccagcacc ccaacaucuu cgacgccggc guggccgggc ugccggacga 1440  
cgacgccggc gagcugccgg ccgcgguugu ggugcuggag cacggcaaga ccaugacgga 1500  
gaaggagauc gucgacuacg uggccagcca ggugaccacc gccagaagc ugcggggcg 1560  
cgugguguuc guggacgagg ucccgaaggg ccugaccggg aagcucgacg cccggaagau 1620

2013001903

ccgcgagauc	cugaucaagg	ccaagaaggg	cggcaagauc	gccguguaag	acuaguuaua	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

<400> 45	
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aggacgccaa	gaacaucaag
aagggcccgg	cgcccuucua
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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	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
gccugccgc	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
ccgaccugu	ucagcuucuu
900	
cgccaagagc	accugaucg
acaaguacga	ccugucgaac
cugcacgaga	ucgccagcgg
960	
gggcgccccg	cugagcaagg
aggugggcga	ggccguggcc
aagcgguucc	accucccg
1020	
cauccgccag	ggcuacggcc
ugaccgagac	cacgagcgcg
auccugauca	ccccgaggg
1080	
ggacgacaag	ccgggcgccg
ugggcaaggu	ggucccgguuc
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	gggcuaccag
guggcgccgg	ccgagcugga
1380	
gagcauccug	cuccagcacc
ccaacauuu	cgacgccggc
guggccgggc	ugccggacga
1440	
cgacgccggc	gagcugccgg
ccgcgguggu	ggugcuggag
cacggcaaga	ccaugacgga
1500	

2013001903

gaaggagauc	gucgacuacg	uggccagcca	ggugaccacc	gccaagaagc	ugcggggcgg	1560
cgugguguuc	guggacgagg	ucccggaagg	ccugaccggg	aagcucgacg	cccggaagau	1620
ccgcgagauc	cugaucaagg	ccaagaagg	cggcaagauc	gccguguaag	acuaguuaua	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

<400> 46	
gggagaaagc	uugaggauug
aggacgccaa	gaacaucaag
aagggcccgg	cgcccuucua
60	
cccgcuggag	gacgggaccg
ccggcgagca	gcuccacaag
gccaugaagc	gguacgccc
120	
ggugccgggc	acgaucgccc
ucaccgacgc	ccacaucgag
gucgacauca	ccuacgcgga
180	
guacuucgag	augagcgugc
gccuggccga	ggccaugaag
cgguacggcc	ugaacaccaa
240	
ccaccggau	c
guggugugcu	cggagaacag
ccugcaguuc	uucaugccgg
ugcugggcgc	
300	
ccucuuc	g
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
aacgcccua	ucgacaagga
1260	
cggcuggcug	cacagcggcg
acaucgccua	cugggacgag
gacgagcacu	ucuucaucgu
1320	
cgaccggcug	aagucgcuga
ucaaguacaa	gggcuaccag
guggcgccgg	ccgagcugga
1380	
gagcauccug	cuccagcacc
ccaacaucuu	cgacgccggc
guggccgggc	ugccggacga
1440	

2013001903

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	ucaaaggcuc	uuuucagagc	cacca			1835

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

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

<400> 47	
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aggacgccaa	gaacaucaag
aagggcccgg	cgcccuucua
60	
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	agcggcagca
ccggccugcc	gaagggggug
gcccugccgc	accggaccgc
660	
cugcgugcgc	uucucgcacg
cccgggaccc	caucuucggc
aaccagauca	ucccgacac
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
agguggggcg	ggccguggcc
aagcgggucc	accucccggg
1020	
cauccgccag	ggcuacggcc
ugaccgagac	cacgagcgcg
auccugauca	ccccgagggg
1080	
ggacgacaag	ccgggcgcgc
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	

2013001903

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
cgugguguuuc	guggacgagg	ucccgaaggg	ccugaccggg	aagcucgacg	cccggaagau	1620
ccgcgagauc	cugaucaagg	ccaagaaggg	cggcaagauc	gccguguaag	acuaguuaa	1680
agacugacua	gcccgauggg	ccucccaacg	ggcccuccuc	cccuccuugc	accgagauua	1740
auagaucuaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	1800
aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	1860
aaaaaaaaa						1869

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

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

<400> 48	
gggagaaagc	uugaggauug
aggacgccaa	gaacaucaag
aagggcccgg	cgcccuucua
60	
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	
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	cgguucggc
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
aggugggcca	ggccguggcc
aagcgguucc	accucccggg
1020	
cauccgccag	ggcuacggcc
ugaccgagac	cacgagcgcg
auccugauca	ccccgagggg
1080	
ggacgacaag	ccgggcgccc
ugggcaaggu	ggucccgguuc
uucgaggcca	agguggugga
1140	

2013001903

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	ugcggggcg	1560
cgugguguuc	guggacgagg	ucccggaagg	ccugaccggg	aagcucgacg	cccggaagau	1620
ccgcgagauc	cugaucaagg	ccaagaagg	cggcaagauc	gccguguaag	acuaguuaua	1680
agacugacua	gcccgauggg	ccucccaacg	ggcccuccuc	cccuccuugc	accgagauua	1740
auaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	1800
aaaaaaugca	uccugcccga	ugggccuccc	aacgggccc	ccuccccucc	uugcaccg	1858

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

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

<400> 49	
gggagaaagc	uugaggau
aggacgcca	gaacauca
aagggcccc	cgcccuuc
ua	60
cccgcuggag	gacgggacc
ccggcgagc	gcuccaca
gccaugaag	gguacgccc
ua	120
ggugccgggc	acgaucgcc
ucaccgacg	ccacaucg
gucgacau	ccuacgcgg
ua	180
guacuucgag	augagcgug
gccuggccg	ggccauga
cgguacggc	ugaacacca
ua	240
ccaccggau	guggugugc
cggagaac	ccugcagu
uucaugccc	ugcuggggc
gc	300
ccucuuc	ggcguggcc
ucgccccgc	gaacgaca
uacaacgag	gggagcugc
ua	360
gaacagcaug	gggaucagc
agccgaccg	gguguucg
agcaagaag	gccugcaga
ua	420
gauccugaac	gugcagaag
agcugccca	cauccaga
aucaucau	uggacagca
ua	480
gaccgacu	acgggcuuc
agucgaug	cacguucg
accagccac	ucccgccgg
g	540
cuucaacg	uacgacuuc
ucccgagag	cuucgacc
gacaagacc	ucgcccuga
ua	600
caugaacag	agcggcagc
ccggccugc	gaagggggg
gcccugccg	accggaccg
gc	660
cugcgugcg	uucucgcac
cccgggacc	caucuucgg
aaccagau	ucccgga
ac	720
cgccauccug	agcguggug
cguuccacc	cggcuucgg
auguucac	cccugggc
ua	780
ccucaucug	ggcuuccgg
ugguccuga	guaccgg
uuc	840
gagccugcag	gacuacaag
uccagagcg	gcugcucg
ccgaccugu	ucagcuucu
ua	900
cgccaagag	accugaucg
acaaguac	ccugucgaa
cugcacgag	ucgccagcg
g	960
gggcgcccc	cugagcaag
aggugggcg	ggccguggc
aagcgguuc	accuccggg
g	1020

2013001903

cauccgccag	ggcuacggcc	ugaccgagac	cacgagcgcg	auccugauca	ccccgaggg	1080
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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	guggcgcccg	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	ucccgaaggg	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	ucaauuccua	cacgugaggc	gcugugauuc	ccuauccccc	uucauucccu	1860
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ggugccgggc	acgaucgccu ucaccgacgc ccacaucgag gucgacauca ccuacgcgga 180
guacuucgag	augagcgugc gccuggccga ggccaugaag cgguacggcc ugaacaccaa 240
ccaccggau	cugugugcu cggagaacag ccugcaguuc uucaugccgg ugcugggcgc 300
ccucuucua	cggcugggccg 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 ucccggagag cuucgaccgg gacaagacca ucgcccugau 600
caugaacagc	agcggcagca ccggccugcc gaagggggug gccugccgc accggaccgc 660
cugcgugcgc	uucucgcacg cccgggaccc caucuucggc aaccagauca ucccgacac 720
cgccauccug	agcugggugc cguuccacca cggcuucggc auguucacga ccugggcua 780
ccucaucugc	ggcuuccggg ugguccugau guaccgguuc gaggaggagc uguuccugcg 840

## 2013001903

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gggcgccccg	cugagcaagg	aggugggcca	ggccguggcc	aagcgguucc	accucccggg	1020
cauccgccag	ggcuacggcc	ugaccgagac	cacgagcgcg	auccugauca	cccccgaggg	1080
ggacgacaag	ccgggcgccc	ugggcaaggu	ggucccguuc	uucgaggcca	agguggugga	1140
ccuggacacc	ggcaagacc	ugggcgugaa	ccagcggggc	gagcugugcg	ugcggggggc	1200
gaugaucaug	agcggcuacg	ugaacaacc	ggaggccacc	aacgcccua	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
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ccgcgagauc	cugaucaagg	ccaagaaggg	cggcaagauc	gccguguaag	acuaguuaua	1680
agacugacua	gcccgauggg	ccucccaacg	ggccuccuc	cccuccuugc	accgagauua	1740
auaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	1800
aaaaaaugca	ucaauucuaa	aacagcucug	ggguuguacc	caccccagag	gcccacgugg	1860
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gccaugaagc	gguacgccc
120	
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ucaccgacgc	ccacaucgag
gucgacauca	ccuacgcgga
180	
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gccuggccga	ggccaugaag
cgguacggcc	ugaacaccaa
240	
ccaccggauc	guggugugcu
cggagaacag	ccugcaguuc
uucaugccgg	ugcugggcgc
300	
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ucgccccggc	gaacgacauc
uacaacgagc	gggagcugcu
360	
gaacagcaug	gggaucagcc
agccgaccgu	gguguucgug
agcaagaagg	gccugcagaa
420	
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agcugcccau	cauccagaag
aucaucauca	uggacagcaa
480	
gaccgacuac	cagggcuucc
agucgaugua	cacguucgug
accagccacc	ucccgccggg
540	
cuucaacgag	uacgacuucg
ucccgagag	cuucgaccgg
gacaagacca	ucgcccugau
600	
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ccggccugcc	gaagggggug
gcccugccgc	accggaccgc
660	



## 2013001903

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ccucaucugc	ggcuuccggg	ugguuccgau	guaccgguuc	gaggaggagc	uguuccugcg	840
gagccugcag	gacuacaaga	uccagagcgc	gcugcucgug	ccgaccugug	ucagcuucuu	900
cgccaagagc	accugaucg	acaaguacga	ccugucgaac	cugcacgaga	ucgccagcgg	960
gggcgcctcc	cugagcaagg	aggugggcca	ggccguggcc	aagcgggucc	accucccggg	1020
cauccgccag	ggcuacggcc	ugaccgagac	cacgagcgcg	auccugauca	cccccgaggg	1080
ggacgacaag	ccgggcgcgc	ugggcaaggu	ggucccgguu	uucgaggcca	agguggugga	1140
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gaugaucaug	agcggcuacg	ugaacaaccc	ggaggccacc	aacgcccuca	ucgacaagga	1260
cggcuggcug	cacagcggcg	acaucgccua	cugggacgag	gacgagcacu	ucuucaucgu	1320
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agacugacua	gcccgauggg	ccucccaacg	ggccuccuc	cccuccuugc	accgagauua	1740
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ggugccgggc	acgaucgccu ucaccgacgc ccacaucgag gucgacauca ccuacgcgga 180
guacuucgag	augagcgugc gccuggccga ggccaugaag cgguacggcc ugaacaccaa 240
ccaccggau	cugggugugcu cggagaacag ccugcaguuc uucaugccgg ugcugggcgc 300
ccucuuc	auc ggcguggccg ucgccccggc gaacgacau uacaacgagc gggagcugcu 360
gaacagcaug	gggaucagcc agccgaccgu gguguucgug agcaagaagg gccugcagaa 420
gauccugaac	gugcagaaga agcugcccau cauccagaag aucaucauca uggacagcaa 480
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2013001903

cuucaacgag	uacgacuucg	ucccgagag	cuucgaccgg	gacaagacca	ucgcccugau	600
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cugcgugcgc	uucucgcacg	cccgggaccc	caucuucggc	aaccagauca	ucccggaac	720
cgccauccug	agcguggugc	cguuccacca	cgguucggc	auguucacga	cccugggcu	780
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gagccugcag	gacuacaaga	uccagagcgc	gcugcucgug	ccgaccugug	ucagcuucuu	900
cgccaagagc	acccugaucg	acaaguacga	ccugucgaac	cugcacgaga	ucgccagcgg	960
gggcgccccg	cugagcaagg	aggugggcca	ggccguggcc	aagcgggucc	accucccggg	1020
cauccgccag	ggcuacggcc	ugaccgagac	cacgagcgcg	auccugauca	ccccgaggg	1080
ggacgacaag	ccgggcgccc	ugggcaaggu	ggucccguu	uucgaggcca	agguggugga	1140
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gaugaucaug	agcggcuacg	ugaacaaccc	ggaggccacc	aacgcccua	ucgacaagga	1260
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gagcauccug	cuccagcacc	ccaacaucuu	cgacgccggc	guggccgggc	ugccggacga	1440
cgacgccggc	gagcugccgg	ccgcgguggu	ggugcuggag	cacggcaaga	ccaugacgga	1500
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aaaaaaugca	uuuuuuuuuu	uuuuuuuuuu	uuuuuuuuuu	u		1841

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	ggugccgggc	acgaucgcc	ucaccgacgc	ccacaucgag	gucgacauca	ccuacgcgga	180
	guacuucgag	augagcgugc	gccuggccga	ggccaugaag	cgguacggcc	ugaacaccaa	240
	ccaccggau	cugggugugc	cggagaacag	ccugcaguuc	uucaugccgg	ugcuggggcg	300
	ccucuucauc	ggcguggccg	ucgccccggc	gaacgacauc	uacaacgagc	gggagcugcu	360
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cuucaacgag	uacgacuucg	ucccgagagag	cuucgaccgg	gacaagacca	ucgcccugau	600
caugaacagc	agcggcagca	ccggccugcc	gaagggggug	gcccugccgc	accggaccgc	660
cugcgugcgc	uucucgcacg	cccgggaccc	caucuucggc	aaccagauca	ucccggaacac	720
cgccauccug	agcguggugc	cguuccacca	cggcuucggc	auguucacga	cccuggggcua	780
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	ggugccgggc	acgaucgccu	ucaccgacgc	ccacaucgag	gucgacauca	ccuacgcgga	180
	guacuucgag	augagcgugc	gccuggccga	ggccaugaag	cgguacggcc	ugaacaccaa	240
	ccaccggauc	guggugugcu	cggagaacag	ccugcaguuc	uucaugccgg	ugcuggggcg	300

2013001903

ccucuaucauc	ggcguggccg	ucgccccggc	gaacgacauc	uacaacgagc	gggagcugcu	360
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gugcuggaga	agaacgugac cgucaccac uccgugaacc ugucgagga cagccacaac 180

2013001903

gggaagcugu gccggcugaa gggcaucgcg cccuccagc uggggaagug caacaucgcc	240
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aacggguccc ugcagugccg caucugcauc ugaccacuag uuauaagacu gacuagcccg	1740
augggcuucc caacggggccc uccuccccuc cuugcaccga gauuaauaaa aaaaaaaaaa	1800
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## 2013001903

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