

Sequence Listing.txt
SEQUENCE LISTING

<110> Tokushima University

<120> Target sequence-specific alteration technique using nucleotide target recognition

<130> 674277

<150> JP2017-158876

<151> 2017-08-21

<150> JP2017-236518

<151> 2017-12-08

<160> 45

<170> PatentIn version 3.5

<210> 1

<211> 224

<212> PRT

<213> Microcystis aeruginosa

<400> 1

Met Val His Ile Tyr Ser Cys Gln Leu Glu Leu His Asp Ser Leu Tyr
1 5 10 15

Tyr Ala Thr Arg Glu Ile Gly Arg Leu Tyr Glu Ser Glu Pro Val Ile
20 25 30

His Asn Tyr Ala Leu Cys Tyr Ala Leu Gly Leu Val Asn Ser Asp Ser
35 40 45

Tyr Arg Tyr Phe Cys Ser Glu Gln Ile Pro Gln Tyr Gln Glu His Leu
50 55 60

Asn Pro Leu Asn Glu Glu Lys Ile Tyr Val Thr Pro Ala Arg Ala Ile
65 70 75 80

Ala His Thr Ala Val Leu Asn Thr Trp Lys Tyr Ala Asn Asn Asn Tyr
85 90 95

His Val Glu Met Glu Lys Thr Gln Lys Asn Ile Pro Ser Phe Gly Arg
100 105 110

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Ala Lys Glu Ile Ala Pro Glu Ser Ile Phe Glu Cys Phe Ile Ile Ser
115 120 125

His His Pro Leu Gln Leu Pro Lys Trp Ile Arg Leu Gly Lys Trp Met
130 135 140

Ser Lys Ala Glu Val Lys Leu Thr Glu Leu Ser Leu Ser Lys Gln Lys
145 150 155 160

Glu Asp Leu Phe Ile Tyr Pro Tyr Pro Leu Asn Pro Leu Asp Val Met
165 170 175

Phe Thr His Gln Val Ile Gly Tyr Asp Val Ile Asn Met Pro Pro Val
180 185 190

Ser Leu Ile Arg Asn Val Arg Met Arg Gly Glu Tyr Tyr Gln Ile Ser
195 200 205

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

<210> 2
<211> 277
<212> PRT
<213> Microcystis aeruginosa

<400> 2

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

Pro Asn Phe Leu Thr Gly Arg His Leu His Ala Leu Phe Leu Thr Leu
20 25 30

Val Ser Ser Val Asp Gln Glu Leu Gly Asn Ile Leu His Thr Ala Glu
35 40 45

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

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Lys Thr Ile Asn Ser Pro Gln Trp Arg His Glu Arg Glu Ile Ala Ser
65 70 75 80

Glu Thr Pro Cys Trp Trp Arg Ile Ser Leu Leu Asp Asp Arg Leu Phe
85 90 95

Gly Lys Leu Thr Ser Leu Trp Leu Asn Leu Asn Pro Lys Gln Pro Trp
100 105 110

His Leu Gly Ser Ala Asp Leu Val Ile Thr Ser Val Leu Ala Thr Pro
115 120 125

Gln Ser Val Gln Pro Trp Ala Asn Ser Cys Thr Tyr Gln Tyr Leu Tyr
130 135 140

Glu Asn Ala Ser Glu Thr Asn Arg Glu Phe Asp Phe Leu Phe Ala Thr
145 150 155 160

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

Glu Leu Val Phe Asn Ser Leu Leu Gly Arg Trp Asn Arg Tyr Ser Gly
180 185 190

Ile Pro Phe Asp Ser Ile Ala Leu Glu Ser Ile Phe Pro Ser Phe Phe
195 200 205

Asp Ile Gln Thr Lys Leu Ala Asp Glu Ala Tyr Lys Asn Gln Ser Ile
210 215 220

Gly Cys Val Gly Glu Ile His Tyr Arg Leu Leu Gly Glu Val Glu Pro
225 230 235 240

Ala Lys Ile Lys Ala Ile Asn Ala Leu Ala Asp Phe Ala Leu Tyr Ala
245 250 255

Gly Val Gly Arg Lys Thr Thr Met Gly Met Gly Met Thr Arg Arg Ile
260 265 270

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Ser Lys Asp Lys Arg
275

<210> 3

<211> 332

<212> PRT

<213> Microcystis aeruginosa

<400> 3

Thr Phe Leu Thr Ser Val Asp Ala Lys Phe Phe His Ser Glu Ile Pro
1 5 10 15

Tyr Lys Pro Met Gly Lys Tyr Val His Phe Leu Thr Ile Arg Val Thr
20 25 30

Glu Ser Tyr Pro Leu Phe Gln Thr Asp Gly Glu Leu Asn Lys Ala Arg
35 40 45

Val Arg Ala Gly Ile Asp Ser Lys Lys Thr Ile Ser Arg Leu Ser Met
50 55 60

Phe Lys Arg Lys Gln Ser Thr Pro Glu Arg Leu Val Gly Arg Glu Leu
65 70 75 80

Leu Arg Asn Tyr Gly Leu Ile Thr Ala Glu Glu Cys Glu Tyr Asn Val
85 90 95

Lys Phe Ala Met Asn Asn Ala Asp Cys Ile Ile Tyr Gly Phe Ala Ile
100 105 110

Gly Asp Ser Gly Ser Glu Lys Ser Lys Val Val Val Asp Thr Ala Phe
115 120 125

Ser Ile Thr Pro Phe Asp Glu Ser His Glu Ser Phe Thr Leu Asn Ala
130 135 140

Pro Tyr Glu Asn Gly Thr Met Ala Ser Lys Gly Glu Asn Asn Thr Lys
145 150 155 160

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Val Gly Glu Val Thr Ser Arg Ile Asn Gln Gln Asp His Ile Arg Pro
165 170 175

Gln Val Phe Phe Pro Ser Ile Val Thr Leu Lys Asp Pro Thr Glu Ala
180 185 190

Ser Phe Leu Tyr Val Phe Asn Asn Ile Leu Arg Thr Arg His Tyr Gly
195 200 205

Ala Gln Thr Thr Arg Thr Gly Arg Val Arg Asn Glu Leu Ile Gly Val
210 215 220

Ile Phe Ala Asp Gly Glu Ile Val Ser Asn Leu Arg Trp Thr Gln Ala
225 230 235 240

Ile Tyr Asp Arg Leu Pro Asp Glu Val Leu His Ser Ile Asp Pro Leu
245 250 255

Asp Glu Asp Leu Val Met Glu Lys Ala Thr Glu Ala Ile Gln Ala Leu
260 265 270

Met Ala Glu Glu Phe Ile Val His Thr Asp Phe Ile Gly Glu Asn Phe
275 280 285

Gln Pro Leu Leu Thr Glu Val Lys Thr Leu Thr Gly Thr Glu Ala Gly
290 295 300

Ile Leu Ser Val Leu Asp Gln Ala Asn Lys Glu Ser Lys Lys Tyr Phe
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Glu Gln Tyr Ile Glu Lys Lys Lys Ala Glu Lys Lys
325 330

<210> 4
<211> 721
<212> PRT
<213> Microcystis aeruginosa

<400> 4

Met Gly Asn Tyr Gln Val Thr Leu Lys Pro Val Tyr Ser Cys Pro Ala

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1	5	10	15
Asp Glu Ile Pro Asp Gly Ile Lys Val Pro Gln Gly Trp Arg Leu Ser	20	25	30
Trp His Gln Val Glu Thr Trp Lys Ala Leu Asn Asp Pro Asp Ile Asp	35	40	45
Val Ile Phe Asn Thr Ala Met Thr Gly Asp Gly Lys Ser Leu Ala Ala	50	55	60
Tyr Leu Arg Thr Leu Gln Gly Tyr Phe Pro Ile Met Gly Leu Tyr Pro	65	70	75
Thr Asn Glu Leu Ala Arg Asp Gln Arg Gly Gln Ile Glu Ala Tyr Ile	85	90	95
Gln Arg Phe Gln Pro Thr Asp Gln Pro Arg Val Asn Leu Leu Thr Gly	100	105	110
Pro Glu Leu Glu Leu Tyr Ala Glu Arg Asp Gly Lys Thr Lys Ala Ile	115	120	125
Ala Leu Glu Thr Arg Ser Lys Gln Ser Glu Ile Leu Leu Thr Asn Pro	130	135	140
Asp Ile Phe His Tyr Leu His Arg Ala Ala Tyr Leu Thr Pro Tyr Asp	145	150	155
Asn Pro Asp Gln Leu Trp Asn Arg Ile Asp Lys His Phe Asp Leu Phe	165	170	175
Leu Phe Asp Glu Phe His Val Phe Gly Thr Pro Gln Val Ala Ser Ile	180	185	190
Ile Asn Thr Met Leu Leu Ile Arg Arg Ala Asn Arg Gly Lys Arg Tyr	195	200	205
Leu Phe Leu Ser Ala Thr Pro Asp Glu Gly Leu Leu Lys Arg Leu Asp			

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215

220

Lys Ala Gly Phe Arg Tyr Arg Ser Ile Asp Pro Val Arg Glu Gly Lys
 225 230 235 240

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

Gly Trp Arg Gln Val Thr Ser Glu Ile Glu Leu Ser Phe Ile Pro Leu
 260 265 270

Pro Ser Ser Phe Gln Thr Ser Glu Asn Trp Leu Lys Glu Asn Lys Glu
 275 280 285

Arg Ile Leu Asp Tyr Phe Lys Arg Tyr Pro Gly Ser Lys Gly Ala Ile
 290 295 300

Ile Leu Asn Ser Ile Ala Ser Val Lys Arg Leu Leu Pro Ile Phe Arg
 305 310 315 320

Glu Leu Leu Ala Thr Ile Gly Leu Thr Val Gly Glu Asn Thr Gly Leu
 325 330 335

Ser Gly Thr Arg Glu Lys Leu Ala Ser Leu Asn Arg Asp Leu Val Ile
 340 345 350

Gly Thr Ser Thr Ile Asp Val Gly Val Asp Phe Lys Ile Asn Phe Leu
 355 360 365

Ile Phe Glu Ser Ser Asp Ala Gly Asn Phe Ile Gln Arg Phe Gly Arg
 370 375 380

Leu Gly Arg His Ser Gly Tyr Asp Arg Lys Gly Thr Ala Val Lys Phe
 385 390 395 400

Thr Asn Phe Thr Ala Ile Ala Leu Val Pro Lys Phe Phe Leu Glu Arg
 405 410 415

Leu Phe Glu Lys Lys Asp Ala Pro Leu Gln Val Gly Glu Arg Tyr Asp

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420

425

430

Arg Ile Gln Leu Gln Glu Ala Ile Lys Ser Asn Tyr Arg His Ile Asn
 435 440 445

Asn Phe Glu Gly Tyr Tyr Gln Arg Trp Gly Ala Val Gln Ser Phe Gln
 450 455 460

Leu Trp Trp Asn Leu Gly Ser Pro Lys Ile Lys Ser Gln Tyr Gly Glu
 465 470 475 480

Ser Arg Gln Lys Phe Gln Gln Glu Cys Glu Glu Val Phe Asp Thr Ser
 485 490 495

Leu Lys Arg Val Ala Gly Arg Val Lys Gly Trp Ala Asp Glu Trp Lys
 500 505 510

Glu Leu Ser Gly Lys Asn Gly Asn Pro Ile Phe Glu Asp Ala Ser Ser
 515 520 525

Phe Arg Gly Ser Ser Pro Leu Leu Cys Gly Leu Tyr Asp Ser Thr Glu
 530 535 540

Pro Glu Glu Cys Asp Arg Phe Lys Thr Tyr Asp Leu Pro Ser Ile Leu
 545 550 555 560

Gly Asn Leu Glu Val Glu Val Trp Arg Lys Gly Glu Phe Lys Arg Gln
 565 570 575

Ile Glu Ala Thr Lys Thr Pro Ile Ala Arg Arg Arg Phe Asp Tyr Cys
 580 585 590

Leu Ala Phe Leu Asn Leu Lys Gly Tyr Arg Glu Glu Arg Leu Asn Trp
 595 600 605

Arg Phe Thr Tyr Asp Gly Asp Leu Gly Glu Ile Ala Ser Ala Trp Lys
 610 615 620

Val Gln Val Leu Thr Gly Ile Gly Val Trp Gln Pro Asp Asn Pro Trp

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625                630                635                640

Leu Asp Arg Ile Ser Arg Glu Leu Arg Asp Leu Ala Leu Val Ser Phe
                645                650                655

Val Phe Ala Tyr Pro Val Ala Ala Val Arg Gln Arg Leu Gln Leu Pro
                660                665                670

Met His Phe Gly Ile Tyr Pro Ile Ser Asp Glu Ser Ser Leu His Ser
                675                680                685

Pro Leu Ser Pro Tyr Ser Ile Ala Ile Gly Gln Ala Ala Leu Leu Leu
        690                695                700

Asp Thr Leu Ala His Arg Phe Lys Gly Lys Gly Gly Glu Val Trp Ile
705                710                715                720

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Cys

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<210> 5
<211> 1156
<212> PRT
<213> Microcystis aeruginosa

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<400> 5

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Met Pro Lys Lys Gln Lys Lys Leu Glu Glu Thr Gly Gln Leu Asn Leu
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Phe Asp Asn Thr Thr Glu Ile Asp Asp Glu Asp Leu Asp Phe Glu Phe
                20                25                30

Glu Asp Ile Asp Leu Glu Ser Leu Val Ser Glu Asp Leu Gly Ile Thr
        35                40                45

Glu Ser Val Ser Asp Arg Arg Val Glu Thr Val Arg Gln Leu Leu Thr
        50                55                60

Leu Lys Leu Leu Arg Glu Ala Ile Arg Ala Glu Asn Pro Asp Asp Arg
65                70                75                80

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Val Met Ala Asp Phe Ala Glu Met Val Leu Pro Asn Leu Leu Arg Leu
85 90 95

Ala Ile Gly Val Thr Ala Lys Gly Gly Asn Phe Ile Glu Ala Val Asp
100 105 110

Arg Gly Arg Glu Leu Arg Asn Lys Pro Lys Ala Lys Arg Asp Asn Ala
115 120 125

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

Asn Leu Ile Glu Lys Arg Leu Gln Lys Leu Asn Thr Thr Val Arg Arg
145 150 155 160

Ile Ile Lys Glu Phe Glu Arg Arg Leu Ala Ile Ala Gly Phe Leu Val
165 170 175

His Asp Phe Glu Lys Phe Ser Tyr Asp Arg Phe Pro Ser Met Ser Glu
180 185 190

Arg Tyr Ile Gln Ile Gln Arg Asp Phe Ile Gln Asp Pro Phe Lys Asn
195 200 205

Gln Asp Pro Arg Lys Leu Ser Arg Glu Glu His Arg Glu Ile Leu Gln
210 215 220

Val Leu Ile Pro Glu Leu Gly Leu Asp Arg Phe Leu Phe Pro Asp Asn
225 230 235 240

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

Asn Thr Gln Arg Arg Asn Asp Thr Asp Leu Asn Thr Ser Glu Asp Gly
260 265 270

Leu Asn Val Arg Leu Asn Asp Arg Val Ile Glu Ser Leu Cys Asp Leu
275 280 285

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Ala Cys Leu Ala Asp Arg Leu Ala Ser Ile Ile Lys His Pro His Asp
290 295 300

Ala Glu Lys Ala Ser Leu Gln Asp Leu Leu Tyr Ser Leu Ser Asp Gly
305 310 315 320

Glu Leu Lys Phe Thr Tyr His Ser Ile Ala Glu Asn Arg Gly Val Leu
325 330 335

Thr Asn Val Leu Asn Asn Ala Val Met Glu Ala His Gln Glu Leu Asp
340 345 350

Tyr Gln Pro Leu Leu Tyr Leu Pro Thr Gly Val Val Tyr Ile Ala Pro
355 360 365

Lys Asn Ala Pro Glu Val Ser Leu Glu Thr Leu Pro Asn Arg Val Val
370 375 380

Asp Thr Ile Lys Ser Leu Cys Ser Gly Glu Leu Gln Arg Lys Gln Thr
385 390 395 400

Gly Phe Gly Arg Asp Gly Lys Gly Met Lys Tyr Ala Asp Tyr Tyr Ser
405 410 415

Gln Phe Phe Asp Asp Ala Gly Leu Met Arg Ala Ala Leu Asn Ala Thr
420 425 430

Leu Arg Ile Leu Gly Asp Asn Lys Ala Ser Val Ala Arg Ser Arg Gly
435 440 445

Glu Asn Leu Ile Lys Phe Gln Gln Gln Gly Val Leu Pro Thr Asp Tyr
450 455 460

Asp Phe His Cys Glu Asp Asp Ile Arg Ile Asp Arg Leu Ala Glu Phe
465 470 475 480

Gly Asp Val Val Thr Arg Lys Ile Trp Gly Asp Arg Leu Glu Lys Ile
485 490 495

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Glu Gln Ala Arg Lys Leu Gln Lys Asn Leu Pro Ala Pro Pro Asp Leu
500 505 510

Asp Leu Ile Ser Glu Ile Ala His Tyr Trp Asn Leu Glu Asn Tyr Leu
515 520 525

Pro Gln Ile Arg Ala Ile Lys Arg Ile Asn Glu Ser Leu Lys Glu Leu
530 535 540

Lys Leu Lys Gly Asn Thr Gly Gly Val Pro Tyr Glu Trp Tyr Tyr Leu
545 550 555 560

Ala Ala Gln Tyr Leu Lys Gln His Pro Gly Ile Glu Asp Ile Arg Pro
565 570 575

Val Ala Glu Asp Leu Ile Ala Phe Leu Ala Ala Lys Ile Ala Ala Ile
580 585 590

Val Ala Gly Tyr Asn Leu Pro Asp Gly Trp Glu Asp Leu Arg Glu Trp
595 600 605

Val Asn Gln Val Val Gln Leu Pro Gly Arg Glu Leu Ala His Ser Ile
610 615 620

Glu Thr Phe Gln Lys Glu Leu Asn His Tyr Asn Ala Ala Lys Lys Gln
625 630 635 640

Gly Arg Gly Arg Gln Leu Leu Cys Ser Ile Ser His Ser Pro Tyr Ser
645 650 655

Val Ser Glu Gln Met Glu Ser Ala Val Leu Phe Thr Pro Gln Val Tyr
660 665 670

Thr Asn Lys Gln Met Leu Ala Gly Ser Asn Ala Lys Arg Asn Ile Ser
675 680 685

Ser Ile Ala Gly Thr Glu Met Met Leu Arg Gln Ile Leu Met Asn Gln
690 695 700

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Thr Gln Ala Val Gly Lys Arg Phe Glu Asp Gly Lys Tyr Arg Tyr Leu
705 710 715 720

Tyr Phe Tyr Pro Thr Tyr Tyr Phe Thr Pro Glu Thr Asn Ser Phe Leu
725 730 735

Gln Lys Ala Tyr Ala Asn Ile Ala Gln Thr Arg Phe Asp Ser Ser Ile
740 745 750

Lys Leu His Phe Val Asp Lys Asn Leu Val Ala Asn Phe Asp Arg Thr
755 760 765

Arg Tyr Gln Ser Val Asp Ser Phe Leu Ile Asp Glu Lys Leu Arg Gln
770 775 780

Lys Lys Glu Thr Ile Asn Glu Glu Glu Asp Gly Lys Lys Asp Arg Thr
785 790 795 800

Phe Lys Leu Ser Tyr Pro Glu Asp Lys Pro Leu Thr Phe Tyr Phe Met
805 810 815

Ala Leu Pro Pro Gly Arg Asn Pro Thr Asp Thr Glu Ser Trp Val Met
820 825 830

Pro Ala Trp Leu Gly Leu Ala Phe Pro Met Ile Leu Asp Val Lys Thr
835 840 845

Val Val Ser Glu Ser Pro Ile Pro Pro Tyr Arg Asp Gly Ala Glu Phe
850 855 860

Glu Glu Thr Val Phe Leu Asp Ser Ala Pro Gln Ala Ile Arg Ser Leu
865 870 875 880

Thr Arg Cys Asp Arg Phe Arg Leu Asp Arg Val Leu Asn Pro Trp Gln
885 890 895

Asp Asn Asp Gly Lys Lys Tyr Ser Ala Pro Leu Asn Thr Leu Thr Ala
900 905 910

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Ala Tyr Ser Ile His Leu Asp Val Asn Ser Lys Gln Gly Lys Thr Gly
915 920 925

Tyr Asp Pro Asn Trp Gly Lys Leu Thr Glu Leu Ala Ile Asn Leu Glu
930 935 940

Thr Ser Pro Leu Tyr Val Phe His Tyr Phe Lys Gln Trp Lys Arg Gly
945 950 955 960

Lys Asp Ala Asp Ile Pro Ser Ala Asn Arg Ile Ala Leu Tyr Leu Tyr
965 970 975

Asp Phe Tyr Pro Cys Phe Asp Pro Tyr Val Gln Ala Asn Arg Thr Asn
980 985 990

Leu Thr Ile Asp Met Thr Ala Glu Ser Pro Leu Asn His Pro Lys Asn
995 1000 1005

Leu Thr Glu Leu Tyr Arg Gln Phe Tyr Arg Ala Lys Ser Ser Lys
1010 1015 1020

Gly Lys Pro Ile Lys Ala Asn Ala Ile Leu Lys Pro Ile Asp Glu
1025 1030 1035

Ala Ala Asp Ile Ile Leu Lys Ala Asp Lys Ala Ile Ser Asp Asp
1040 1045 1050

Leu Thr Ser Leu Val Ala Ala Arg Leu Phe Lys Leu Met Asp Arg
1055 1060 1065

Val Arg Ser Gln Thr Ala Glu Gly Arg Tyr Val Ile Lys Glu Arg
1070 1075 1080

Asp Gln Glu Arg Glu Lys Ile Leu Asp Phe Ala Lys Tyr Phe Val
1085 1090 1095

Lys Asn Val Phe Glu Glu Ser Phe Glu Ser Asp Arg Ala Arg Leu
1100 1105 1110

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Ala Gly Arg Gln Leu Asn Ile Ile Arg Asp Thr Cys Glu Phe Leu
1115 1120 1125

Tyr Arg Leu Glu Met Asp Lys Glu Arg Arg Gln Arg Gln Val Gln
1130 1135 1140

Pro Leu Asp Thr Ser Asn Ser Ser Ser Glu Glu Glu Glu
1145 1150 1155

<210> 6
<211> 109
<212> RNA
<213> Artificial

<220>
<223> TiDcrRNA

<220>
<221> misc_feature
<222> (38)..(72)
<223> n is a, c, g, or u

<400> 6
guuccaauua aucuuaagcc cuauuaggga uugaaacnnn nnnnnnnnnn nnnnnnnnnn 60
nnnnnnnnnn nnguuccaau uaaucuuaag ccuauuagg gauugaaac 109

<210> 7
<211> 675
<212> DNA
<213> Artificial

<220>
<223> Cas5d nucleotide sequence for expression in Escherichia coli

<400> 7
atggtgcata tttatagctg ccagctggaa ctgcatgata gcctgtatta tgcgacccgc 60
gaaattggcc gcctgtatga aagcgaaccg gtgattcata actatgcgct gtgctatgcg 120
ctgggcctgg tgaacagcga tagctatcgc tatttctgca gcgaacagat tccgcagtat 180
caggaacatc tgaacccgct gaacgaagaa aaaatttatg tgaccccggc gcgcgcgatt 240
gcgcataccg cgggtgctgaa cacctggaaa tatgcgaaca acaactatca tgtggaaatg 300

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gaaaaaaccc agaaaaacat tccgagcttc ggccgcgcga aagaaattgc gccggaaagc	360
attttcgaat gcttcattat tagccatcat ccgctgcagc tgccgaaatg gattcgcctg	420
ggcaaatgga tgagcaaagc ggaagtgaac ctgaccgaac tgagcctgag caaacagaaa	480
gaagatctgt tcatttatcc gtatccgctg aaccgcctgg atgtgatgtt caccatcag	540
gtgattggct atgatgtgat taacatgccg ccggtgagcc tgattcgaa cgtgcgcatg	600
cgcggcgaat attatcagat tagcgatcgc ccggatctga aaattccggc acgtctgagc	660
tatcatttcg gctaa	675

<210> 8
 <211> 834
 <212> DNA
 <213> Artificial

<220>
 <223> Cas6d nucleotide sequence for expression in Escherichia coli

<400> 8	
atgccgtata gcctgggtgct gaacctgacc ccgcgcagcc cgatttatcc gaacttcctg	60
accggccgcc atctgcatgc gctgttcctg accctgggtga gcagcgtgga tcaggaactg	120
ggcaacattc tgcataccgc ggaagcggat aaagcgttca ccctgagccc gctgcagatg	180
cagagcggcg gcaaaacat taacagcccg cagtggcgcc atgaacgcga aattgcgagc	240
gaaaccccggt gctgggtggcg cattagcctg ctggatgatc gcctgttcgg caaactgacc	300
agcctgtggc tgaacctgaa cccgaaacag ccgtggcatc tgggcagcgc ggatctgggtg	360
attaccagcg tgctggcgac cccgcagagc gtgcagccgt gggcgaacag ctgcacctat	420
cagtatctgt atgaaaacgc gagcgaacc aaccgcgaat tcgatttcct gttcgcgacc	480
ccggtgacct tccgccaggg caaattcgat agcgcgctgc cgacccgcga actggtgttc	540
aacagcctgc tgggccgctg gaaccgctat agcggcattc cgttcgatag cattgcgctg	600
gaaagcattt tcccagagctt cttcgatatt cagaccaaac tggcggatga agcgtataaa	660
aaccagagca ttggctgcgt gggcgaaatt cattatcgcc tgctgggcga agtggaaaccg	720
gcgaaaatta aagcgattaa cgcgctggcg gatttcgcgc tgtatgcggg cgtgggccgc	780
aaaaccacca tgggcatggg catgaccgc cgcattagca aagataaacg ctaa	834

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<210> 9
<211> 1002
<212> DNA
<213> Artificial

<220>

<223> Cas7d nucleotide sequence for expression in Escherichia coli

<400> 9
atgaccttcc tgaccagcgt ggatgcgaaa ttcttcata gcgaaattcc gtataaaccg 60
atgggcaaat atgtgcattt cctgaccatt cgcgtgaccg aaagctatcc gctgttccag 120
accgatggcg aactgaacaa agcgcgcgtg cgcgcgggca ttgacagcaa gaaaaccatt 180
agccgcctga gcatgttcaa acgcaaacag agcaccgccg aacgcctggg gggccgcgaa 240
ctgctgcgca actatggcct gattaccgcg gaagaatgcg aatataacgt gaaattcgcg 300
atgaacaacg cggattgcat tatttatggc ttcgcgattg gcgatagcgg cagcgaaaaa 360
agcaaagtgg tggatggatac cgcgttcagc attaccccg tcatgaaag ccatgagagc 420
ttcaccctga acgcgccgta tgaaaacggc acgatggcga gcaaaggcga aaacaacacc 480
aaagtgggcg aagtgaccag ccgcattaac cagcaggatc atattcgccc gcaggtgttc 540
ttcccgagca ttgtgaccct gaaagatccg accgaagcga gcttcctgta tgtgttcaac 600
aacattctgc gcacccgcc aattggcgcg cagaccaccc gcaccggccg cgtgcgcaac 660
gaactgattg gcgtgatttt cgcggatggc gaaattgtga gcaacctgcg ctggaccag 720
gcgatttatg atcgctgcc ggatgaagtg ctgcatagca ttgatccgct ggatgaagat 780
ctggtgatgg aaaaagcgac cgaagcgatt caggcgctga tggcggaaga atttattgtg 840
cataccgatt tcattggcga aaacttccag ccgctgctga ccgaagtga aaccctgacc 900
ggcaccgaag cgggcattct gagcgtgctg gatcaggcga acaaagaaag caaaaaatat 960
ttcgaacagt atattgaaaa gaaaaaggcg gaaaagaaat aa 1002

<210> 10
<211> 2166
<212> DNA
<213> Artificial

<220>

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<223> Cas3d nucleotide sequence for expression in Escherichia coli

<400> 10

atgggaaact atcaggtgac tcttaagcca gtgtattctt gccagctga cgagatccca	60
gacggaatca aggtgccaca gggatggaga ctttcttggc accaggtgga gacttggaag	120
gctcttaacg acccagacat cgacgtgac ttcaacactg ctatgactgg agacggaaag	180
tctcttgctg cttatcttag aactcttcag ggatatttcc caatcatggg actttatcca	240
actaacgagc ttgctagaga tcagagagga cagatcgagg cttatatcca gagattccag	300
ccaactgacc agccaagagt gaaccttctt actggaccag agcttgagct ttatgctgag	360
agagacggaa agactaaggc tatcgctctt gagactagat ctaagcagtc tgagatcctt	420
cttactaacc cagacatctt ccactatctt cacagagctg cttatcttac tccatatgac	480
aaccagacc agctttggaa cagaatcgac aagcattcg accttttctt tttcgacgag	540
ttccacgtgt tcggaactcc acaggtggct tctatcatca acactatgct tcttatcaga	600
agagctaaca gaggaaagag atatcttttc ctttctgcta ctccagacga gggacttctt	660
aagagacttg acaaggctgg attcagatat agatctatcg acccagtgag agagggaaag	720
tatagattcc cagacactcc agaggaggct aactctcttg ctccagcagg atggagacag	780
gtgacttctg agatcgagct ttctttcatc ccacttccat cttctttcca gacttctgag	840
aactggctta aggagaacaa ggagagaatc cttgactatt tcaagagata tccaggatct	900
aaggagacta tcattcttaa ctctatcgct tctgtgaaga gacttcttcc aatcttcaga	960
gagcttcttg ctactatcgg acttactgtg ggagagaaca ctggactttc tggaactaga	1020
gagaaacttg cttctcttaa cagagatctt gtgatcgga cttctactat cgacgtggga	1080
gtggacttca agatcaactt cttatcttc gagtcttctg acgctggaaa cttcatccag	1140
agattcggaa gacttggaag acactctgga tatgacagaa agggaactgc tgtgaagttc	1200
actaacttca ctgctatcgc tcttgtgcca aagttcttcc ttgagagact tttcgagaag	1260
aaggacgctc cacttcaggt gggagagaga tatgacagaa tccagcttca ggaggctatc	1320
aagtctaact atagacacat caacaacttc gagggatatt atcagagatg gggagctgtg	1380
cagtctttcc agctttggtg gaaccttgga tctccaaaga tcaagtctca gtatggagag	1440
tcaagacaga agttccagca ggagtgcgag gaggtgttcg acacttctct taagagagtg	1500

Sequence Listing.txt

gctggaagag tgaagggatg ggctgacgag tggaaggagc tttctggaaa gaacggaaac	1560
ccaatcttcg aggacgcttc ttctttcaga ggatcttctc cacttctttg cggactttat	1620
gactctactg agccagagga gtgcgacaga ttcaagactt atgaccttcc atctatcctt	1680
ggaaaccttg aggtggaggt gtggagaaag ggagagttca agagacagat cgaggctact	1740
aagactccaa tcgctagaag aagattcgac tattgccttg ctttccttaa ccttaaggga	1800
tatagagagg agagacttaa ctggagattc acttatgacg gagatcttgg agagatcgct	1860
tctgcttgga aggtgcaggt gcttactgga atcggagtggt ggcagccaga caacccttgg	1920
cttgacagaa tctcaagaga gcttagagat cttgctcttg tgtctttcgt gttcgcttat	1980
ccagtggctg ctgtgagaca gagacttcag cttccaatgc acttcggaat ctatccaatc	2040
tctgacgagt cttctcttca ctctccactt tctccatatt ctatcgctat cggacaggct	2100
gctcttcttc ttgacactct tgctcacaga ttcaagggaaggaggagaga ggtgtggatc	2160
tgctag	2166

<210> 11
 <211> 3471
 <212> DNA
 <213> Artificial

<220>
 <223> Cas10d nucleotide sequence for expression in Escherichia coli

<400> 11	
atgccaaaga agcagaagaa gcttgaggag actggacagc ttaacctttt cgacaacact	60
actgagatcg acgacgagga ccttgacttc gagttcgagg acatcgacct tgagtctctt	120
gtgtctgagg accttggaat cactgagtct gtgtctgaca gaagagtgga gactgtgaga	180
cagcttctta ctcttaagct tcttagagag gctatcagag ctgagaaccc agacgacaga	240
gtgatggctg acttcgctga gatgggtgctt ccaaaccctt ttagacttgc tatcggagtg	300
actgctaagg gaggaactt catcgaggct gtggacagag gaagagagct tagaaacaag	360
ccaaaggcta agagagacaa cgctggagat cagtctctta acactcacct tcttaacgga	420
cttttcccag ctaaccttat cgagaagaga cttcagaagc ttaacactac tgtgagaaga	480
atcatcaagg agttcgagag aagacttgct atcgttggat tccttgtgca cgacttcgag	540

Sequence Listing.txt

aagttctctt atgacagatt cccatctatg tctgagagat atatccagat ccagagagac	600
ttcatccagg acccattcaa gaaccaggac ccaagaaagc tttcaagaga ggagcacaga	660
gagatccttc aggtgcttat cccagagctt ggacttgaca gattcctttt cccagacaac	720
ccagagagat ggcttgagta tcttgacgac cttctttata tcgctaagaa cactcagaga	780
agaaacgaca ctgaccttaa cacttctgag gacggactta acgtgagact taacgacaga	840
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cacccacacg acgctgagaa ggcttctctt caggaccttc tttattctct ttctgacgga	960
gagcttaagt tcacttatca ctctatcgct gagaacagag gagtgcttac taacgtgctt	1020
aacaacgctg tgatggaggc tcaccaggag cttgactatc agccacttct ttatcttcca	1080
actggagtggtgtgtatcgc tccaaagaac gctccagagg tgtctcttga gactcttcca	1140
aacagagtgg tggacactat caagtctctt tgctctggag agcttcagag aaagcagact	1200
ggattcggaa gagacggaaa gggatatgaag tatgctgact attattctca gttcttcgac	1260
gacgctggac ttatgagagc tgctcttaac gctactctta gaatccttgg agacaacaag	1320
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aagcttcaga agaaccttcc agctccacca gaccttgacc ttatctctga gatcgctcac	1560
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gctgctcagt atcttaagca gcaccagga atcgaggaca tcagaccagt ggctgaggac	1740
cttatcgctt tccttgctgc taagatcgct gctatcgagg ctggatataa ccttccagac	1800
ggatgggagg accttagaga gtgggtgaac caggtggtgc agcttccagg aagagagctt	1860
gctcactcta tcgagacttt ccagaaggag cttaaccact ataacgctgc taagaagcag	1920
ggaagaggaa gacagcttct ttgctctatc tctcactctc catattctgt gtctgagcag	1980
atggagtctg ctgtgctttt cactccacag gtgtatacta acaagcagat gcttgctgga	2040
tctaacgcta agagaaacat ctcttctatc gctggaactg agatgatgct tagacagatc	2100

Sequence Listing.txt

```

cttatgaacc agactcaggc tgtgggaaag agattcgagg acggaaagta tagatatctt 2160
tattttctatc caacttatta tttcactcca gagactaact ctttccttca gaaggcttat 2220
gctaacatcg ctgagactag attcgactct tctatcaagc ttcacttcgt ggacaagaac 2280
cttgtggcta acttcgacag aactagatat cagtctgtgg actctttcct tatcgacgag 2340
aagcttagac agaagaagga gactatcaac gaggaggagg acggaaagaa ggacagaact 2400
ttcaagcttt cttatccaga ggacaagcca cttactttct atttcatggc tcttccacca 2460
ggaagaaacc caactgacac tgagtcttgg gtaatgccag cttggcttgg acttgctttc 2520
ccaatgatcc ttgacgtgaa gactgtggtg tctgagtctc caatcccacc atatagagac 2580
ggagctgagt tcgaggagac tgtgttcctt gactctgctc cacaggctat cagatctctt 2640
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aagaagtatt ctgctccact taacactctt actgctgctt attctatcca ccttgacgtg 2760
aactctaagc agggaaagac tggatatgac ccaaactggg gaaagcttac tgagcttgct 2820
atcaaccttg agacttctcc actttatgtg ttccactatt tcaagcagtg gaagagagga 2880
aaggacgctg acatcccacg tgctaacaga atcgctcttt atctttatga cttctatcca 2940
tgcttcgacc catatgtgca ggctaacaga actaacctta ctatcgacat gactgctgag 3000
tctccactta accacccaaa gaaccttact gagctttata gacagttcta tagagctaag 3060
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gacatcatcc ttaaggctga caaggctatc tctgacgacc ttacttctct tgtggctgct 3180
agacttttca agcttatgga cagagtgaga tctcagactg ctgagggaag atatgtgac 3240
aaggagagag atcaggagag agagaagatc cttgacttcg ctaagtattt cgtgaagaac 3300
gtgttcgagg agtctttcga gtctgacaga gctagacttg ctggaagaca gcttaacatc 3360
atcagagaca cttgcgagtt cttttataga cttgagatgg acaaggagag aagacagaga 3420
caggtgcagc cacttgacac ttctaactct tcttctgagg aggaggagta a 3471

```

```

<210> 12
<211> 35
<212> DNA
<213> Artificial

```

Sequence Listing.txt

<220>
<223> J23108 synthesis promoter

<400> 12
ctgacagcta gctcagtcct aggtataatg ctagc 35

<210> 13
<211> 36
<212> DNA
<213> Artificial

<220>
<223> Ribosomal binding sequence

<400> 13
aataattttg tttaacttta agaaggagat atacat 36

<210> 14
<211> 24
<212> DNA
<213> Artificial

<220>
<223> Terminator sequence STOP767

<400> 14
agatcctgta aaacgacggc cagt 24

<210> 15
<211> 19
<212> DNA
<213> Artificial

<220>
<223> Terminator sequence STOP768(1)

<400> 15
cgccagggtt ttcccagtc 19

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

<220>
<223> Terminator sequence TOP768(2)

Sequence Listing.txt

<400> 16
cgccagggtt ttcccagtc 19

<210> 17
<211> 47
<212> DNA
<213> Artificial

<220>
<223> T7 terminator sequence

<400> 17
tagcataacc ccttggggcc tctaaacggg tcttgagggg ttttttg 47

<210> 18
<211> 37
<212> DNA
<213> Artificial

<220>
<223> CRISPR repeat sequence

<400> 18
gttccaatta atcttaagcc ctattagga ttgaaac 37

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

<220>
<223> T7 promoter sequence

<400> 19
taatacgact cactatagg 19

<210> 20
<211> 109
<212> DNA
<213> Artificial

<220>
<223> crRNA expression cassette

<400> 20
gttccaatta atcttaagcc ctattagga ttgaaacggt aataatacga ctactatag 60

ggagaaaagga tcgttccaat taatcttaag ccctattagg gattgaaac 109

Sequence Listing.txt

<210> 21
<211> 581
<212> DNA
<213> Artificial

<220>
<223> Synthesis cccdB gene expression cassette

<400> 21
aggctttaat acgactcact atagggagaa aggatccata aaggaggtaa ataatgaagc 60
agcgtattac agtgacagtt gacagcgaca gctatcagtt gctcaaggca tatatgatgt 120
caatatctcc ggtctggtaa gcacaaccat gcagaatgaa gcccgtcgtc tgcgtgccga 180
acgctggaaa gcggaaaatc aggaagggat ggctgaggtc gcccggttta ttgaaatgaa 240
cggctctttt gctgacgaga acagggactg gtgaaatgca gtttaagggtt tacacctata 300
aaagagagag ccgttatcgt ctgtttgtgg atgtacagag tgatattatt gacacgcccg 360
ggcgacggat ggtgatcccc ctggccagtg cacgtctgct gtcagataaa gtctcccgtg 420
aactttaccc ggtggtgcat atcggggatg aaagctggcg catgatgacc accgatatgg 480
ccagtgtgcc ggtctccgtt atcggggaag aagtggctga tctcagccac cgcgaaaatg 540
acatcaaaaa cgccattaac ctgatgttct ggggaatata a 581

<210> 22
<211> 18
<212> PRT
<213> Artificial

<220>
<223> Nuclear localizing signal (NLS) amino acid sequence

<400> 22

Asp	Pro	Lys	Lys	Lys	Arg	Lys	Val	Asp	Pro	Lys	Lys	Lys	Arg	Lys	Val
1				5				10					15		

Ser Gly

<210> 23
<211> 54

Sequence Listing.txt

<212> DNA
 <213> Artificial
 <220>
 <223> NLS nucleotide sequence
 <400> 23
 gacccaaaga agaagcggaa ggtagaccct aagaagaagc gcaaggtttc tgga 54

<210> 24
 <211> 20
 <212> PRT
 <213> Artificial

<220>
 <223> Self-cleaving peptide 2A amino acid sequence

<400> 24
 Gly Ser Glu Gly Arg Gly Ser Leu Leu Thr Cys Gly Asp Val Glu Glu
 1 5 10 15

Asn Pro Gly Pro
 20

<210> 25
 <211> 60
 <212> DNA
 <213> Artificial

<220>
 <223> Self-cleaving peptide 2A(1) coding sequence

<400> 25
 ggctctgagg gcagaggcag cctgctgacc tgcggcgacg tggaggaaaa ccctggccct 60

<210> 26
 <211> 60
 <212> DNA
 <213> Artificial

<220>
 <223> Self-cleaving peptide 2A(2) coding sequence

<400> 26
 gggctctgagg gacgcggctc cctgctcacc tgtggagatg tggaagagaa cccaggcccc 60

Sequence Listing.txt

```

<210> 27
<211> 60
<212> DNA
<213> Artificial

<220>
<223> Self-cleaving peptide 2A(3) coding sequence

<400> 27
ggttctgaag gcagaggctc tctgctgaca tgtggggatg tggaggaaaa tcctggccct      60

<210> 28
<211> 60
<212> DNA
<213> Artificial

<220>
<223> Self-cleaving peptide 2A(4) coding sequence

<400> 28
ggatccgagg gcagaggaag tctgctaaca tgcggtgacg ttgaggagaa tcccgggcca      60

<210> 29
<211> 820
<212> DNA
<213> Artificial

<220>
<223> 2 x cauliflower mosaic virus 35S gene promoter + omega sequence

<400> 29
gccaacatgg tggagcacga cactctcgtc tactccaaga atatcaaaga tacagtctca      60
gaagaccaaaa gggctattga gacttttcaa caaagggtaa tatcgggaaa cctcctcgga      120
ttccattgcc cagctatctg tcacttcatc aaaaggacag tagaaaagga aggtggcacc      180
tacaaatgcc atcattgcga taaaggaaag gctatcgttc aagatgcctc tgccgacagt      240
gggtcccaaag atggaccccc acccacgagg agcatcgttg aaaaagaaga cgttccaacc      300
acgtcttcaa agcaagtgga ttgatgtgaa catggtggag cacgacactc tcgtctactc      360
caagaatatc aaagatacag tctcagaaga ccaaagggtc attgagactt ttcaacaaag      420
ggtaatatcg ggaaacctcc tcggattcca ttgccagct atctgtcact tcatcaaaag      480
gacagtagaa aaggaagggtg gcacctacaa atgccatcat tgcgataaag gaaaggctat      540
cgttcaagat gcctctgccg acagtgggtcc caaagatgga ccccccacca cgaggagcat      600

```

Sequence Listing.txt

```
cgtggaaaaa gaagacgttc caaccacgtc ttcaaagcaa gtggattgat gtgatatctc 660
cactgacgta agggatgacg cacaatccca ctatccttcg caagaccctt cctctatata 720
aggaagttca tttcatttgg agaggccggt ctagagtatt ttacaacaa ttaccaacaa 780
caacaaacaa caaacaacat tacaattact atttacaatt 820
```

```
<210> 30
<211> 447
<212> DNA
<213> Artificial
```

```
<220>
<223> Arabidopsis shock protein 18.2kDa gene terminator
```

```
<400> 30
atatgaagat gaagatgaaa tatttgggtgt gtcaaataaa aagcttgtgt gcttaagttt 60
gtgttttttt cttggcttgt tgtgttatga atttgtggct ttttctaata tttaatgaat 120
gtaagatctc attataatga ataaacaaat gtttctataa tccattgtga atgttttggt 180
ggatctcttc tgcagcatat aactactgta tgtgctatgg tatggactat ggaatatgat 240
taaagataag atgggctcat agagtaaaac gaggcgaggg acctataaac ctcccttcat 300
catgctattt catgatctat ttataaaaat aaagatgtag aaaaaagtaa gcgtaataac 360
cgcaaaacaa atgatttaaa acatggcaca taatgaggag attaagttcg gtttacgttt 420
attttagtac taattgtaac gtgagac 447
```

```
<210> 31
<211> 97
<212> DNA
<213> Artificial
```

```
<220>
<223> crRNA expression cassette
```

```
<400> 31
gttccaatta atcttaagcc ctattaggga ttgaaacgga gaccctcaat tgtcgggtctc 60
gttccaatta atcttaagcc ctattaggga ttgaaac 97
```

```
<210> 32
<211> 448
```

Sequence Listing.txt

<212> DNA

<213> Artificial

<220>

<223> Arabidopsis U6 snRNA-26 gene promoter sequence

<400> 32

```
aagcttcggt gaacaacgga aactcgactt gccttcgca caatacatca tttcttctta      60
gctttttttc ttcttcttcg ttcatacagt ttttttttgt ttatcagctt acattttctt      120
gaaccgtagc tttcgttttc ttctttttaa ctttccattc ggagtttttg tatcttggtt      180
catagtttgt cccaggatta gaatgattag gcatcgaacc ttcaagaatt tgattgaata      240
aaacatcttc attcttaaga tatgaagata atcttcaaaa ggcccctggg aatctgaaag      300
aagagaagca ggcccattta tatgggaaag aacaatagta tttcttatat aggcccattt      360
aagttgaaaa caatcttcaa aagtcccaca tcgcttagat aagaaaacga agctgagttt      420
atatacagct agagtcgaag tagtgatt                                     448
```

<210> 33

<211> 723

<212> DNA

<213> Artificial

<220>

<223> 2xNLS + Cas5d

<400> 33

```
gacccaaaga agaagcggaa ggtagaccct aagaagaagc gcaaggtttc tggagtgcac      60
atctattctt gccagcttga gcttcacgac tctctttatt atgctactag agagatcgga      120
agactttatg agtctgagcc agtgatccac aactatgctc tttgctatgc tcttggactt      180
gtgaactctg actcttatag atatttctgc tctgagcaga tcccacagta tcaggagcac      240
cttaaccacac ttaacgagga gaagatctat gtgactccag ctagagctat cgctcacact      300
gctgtgctta acacttgga gtagtctaac aacaactatc acgtggagat ggagaagact      360
cagaagaaca tcccatcttt cggaagagct aaggagatcg ctccagagtc tatcttcgag      420
tgcttcatca tctctacca cccacttcag cttccaaagt ggatcagact tggaaagtgg      480
atgtctaagg ctgaggtgaa gcttactgag ctttctcttt ctaagcagaa ggaggacctt      540
ttcatctatc catatccact taaccactt gacgtgatgt tcactacca gggttatcgga      600
```

Sequence Listing.txt

tatgacgtga tcaacatgcc accagtgtct cttatcagaa acgtgagaat gagaggagag	660
tattatcaga tctctgacag accagacctt aagatcccag ctagactttc ttatcacttc	720
gga	723

<210> 34
 <211> 882
 <212> DNA
 <213> Artificial

<220>
 <223> 2xNLS + Cas6d

<400> 34	
gacccaaaga agaagcggaa ggtagaccct aagaagaagc gcaaggtttc tggaccatat	60
tctcttgtgc ttaaccttac tccaagatct ccaatctatc caaacttcct tactggaaga	120
caccttcacg ctcttttcct tactcttgtg tcttctgtgg accaggagct tggaaacatc	180
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atcggatgcg tgggagagat ccactataga cttcttggag aggtggagcc agctaagatc	780
aaggctatca acgctcttgc tgacttcgct ctttatgctg gagtgggaag aaagactact	840
atggggaatgg gaatgactag aagaatctct aaggacaaga ga	882

<210> 35
 <211> 1053
 <212> DNA
 <213> Artificial

Sequence Listing.txt

<220>

<223> 2xNLS + Cas7d

<400> 35

```

gacccaaaga agaagcggaa ggtagaccct aagaagaagc gcaaggtttc tggaactttc      60
cttacttctg tggacgctaa gttcttccac tctgagatcc catataagcc aatgggaaag      120
tatgtgcact tccttactat cagagtgact gagtcttata cacttttcca gactgacgga      180
gagcttaaca aggctagagt gagagctgga atcgactcta agaagactat ctcaagactt      240
tctatgttca agagaaagca gtctactcca gagagacttg tgggaagaga gcttcttaga      300
aactatggac ttatcactgc tgaggagtgc gagtataacg tgaagttcgc tatgaacaac      360
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gtgggtggaca ctgctttctc tatcactcca ttcgacgagt ctcacgagtc tttcactctt      480
aacgctccat atgagaacgg aactatggct tctaaggagg agaacaacac taagggtggga      540
gaggtgactt caagaatcaa ccagcaggac cacatcagac cacaggtggt cttcccatct      600
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agaactagac actatggtgc tcagactact agaactggaa gagtgagaaa cgagcttatc      720
ggagtgatct tcgctgacgg agagatcgtg tctaacctta gatggactca ggctatctat      780
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ttcatcggag agaacttcca gccacttctt actgaggtga agactcttac tggaactgag      960
gctggaatcc tttctgtgct tgaccaggct aacaaggagt ctaagaagta tttcgagcag     1020
tatatcgaga agaagaaggc tgagaagaag taa                                     1053

```

<210> 36

<211> 2217

<212> DNA

<213> Artificial

<220>

<223> 2xNLS + Cas3d

<400> 36

```

atggacccaa agaagaagcg gaaggtagac cctaagaaga agcgcaaggt ttctggagga      60

```

Sequence Listing.txt

aactatcagg tgactcttaa gccagtgtat tcttgcccag ctgacgagat cccagacgga	120
atcaaggtgc cacagggatg gagactttct tggcaccagg tggagacttg gaaggctctt	180
aacgaccag acatcgacgt gatcttcaac actgctatga ctggagacgg aaagtctctt	240
gctgcttatt ttagaactct tcagggatat ttcccaatca tgggacttta tccaactaac	300
gagcttgcta gagatcagag aggacagatc gaggcttata tccagagatt ccagccaact	360
gaccagccaa gagtgaacct tcttactgga ccagagcttg agctttatgc tgagagagac	420
ggaaagacta aggctatcgc tcttgagact agatctaagc agtctgagat ctttcttact	480
aacccagaca tcttccacta tcttcacaga gctgcttatt ttactccata tgacaaccca	540
gaccagcttt ggaacagaat cgacaagcac ttgaccttt tccttttcga cgagttccac	600
gtgttcggaa ctccacaggt ggcttctatc atcaacta tgcttcttat cagaagagct	660
aacagaggaa agagatatct tttcctttct gctactccag acgagggact tcttaagaga	720
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tctgagatcg agctttcttt catcccactt ccatcttctt tccagacttc tgagaactgg	900
cttaaggaga acaaggagag aatccttgac tatttcaaga gatatccagg atctaaggga	960
gctatcatcc ttaactctat cgcttctgtg aagagacttc ttccaatctt cagagagctt	1020
cttgctacta tcggacttac tgtgggagag aacactggac tttctggaac tagagagaaa	1080
cttgcttctc ttaacagaga tcttgtgatc ggaacttcta ctatcgacgt gggagtggac	1140
ttcaagatca acttccttat cttcgagtct tctgacgctg gaaacttcat ccagagattc	1200
ggaagacttg gaagacactc tggatatgac agaaaggga ctgctgtgaa gttcactaac	1260
ttcactgcta tcgctcttgt gccaaagttc ttccttgaga gacttttcga gaagaaggac	1320
gctccacttc aggtgggaga gagatatgac agaatccagc ttcaggaggc tatcaagtct	1380
aactatagac acatcaaaa cttcgaggga tattatcaga gatggggagc tgtgcagtct	1440
ttccagcttt ggtggaacct tggatctcca aagatcaagt ctgagtatgg agagtcaaga	1500
cagaagttcc agcaggagtg cgaggaggtg ttcgacactt ctcttaagag agtggctgga	1560
agagtgaagg gatgggctga cgagtggaag gagctttctg gaaagaacgg aaacccaatc	1620

Sequence Listing.txt

ttcgaggacg cttcttcttt cagaggatct tctccacttc ttgcgaggact ttatgactct	1680
actgagccag aggagtgcga cagattcaag acttatgacc ttccatctat ccttggaac	1740
cttgaggtgg aggtgtggag aaagggagag ttcaagagac agatcgaggc tactaagact	1800
ccaatcgcta gaagaagatt cgactattgc cttgctttcc ttaaccttaa gggatataga	1860
gaggagagac ttaactggag attcacttat gacggagatc ttggagagat cgcttctgct	1920
tggaaggtgc aggtgcttac tggaatcgga gtgtggcagc cagacaaccc ttggcttgac	1980
agaatctcaa gagagcttag agatcttgct cttgtgtctt tcgtgttcgc ttatccagtg	2040
gctgtgtga gacagagact tcagcttcca atgcacttcg gaatctatcc aatctctgac	2100
gagtcttctc ttactctcc actttctcca tattctatcg ctatcggaca ggctgctctt	2160
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<210> 37
 <211> 3519
 <212> DNA
 <213> Artificial

<220>
 <223> 2xNLS + Cas10d

<400> 37	
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gacgacgagg accttgactt cgagttcgag gacatcgacc ttgagtctct tgtgtctgag	180
gaccttgga tctactgagtc tgtgtctgac agaagagtgg agactgtgag acagcttctt	240
actcttaagc ttcttagaga ggctatcaga gctgagaacc cagacgacag agtgatggct	300
gacttcgctg agatgggtgct tccaaacctt cttagacttg ctatcggagt gactgctaag	360
ggaggaaact tcatcgaggc tgtggacaga ggaagagagc ttagaaacaa gccaaaggct	420
aagagagaca acgctggaga tcagtctctt aacactcacc ttcttaacgg acttttccca	480
gctaacctta tcgagaagag acttcagaag cttaacacta ctgtgagaag aatcatcaag	540
gagttcgaga gaagacttgc tatcgtgga ttcttgtgc acgacttcga gaagttctct	600
tatgacagat tcccatctat gtctgagaga tatatccaga tccagagaga cttcatccag	660

Sequence Listing.txt

gacccattca agaaccagga cccaagaaag ctttcaagag aggagcacag agagatcctt	720
caggtgctta tcccagagct tggacttgac agattccttt tcccagacaa cccagagaga	780
tggcttgagt atcttgacga ctttctttat atcgctaaga acactcagag aagaaacgac	840
actgacctta acacttctga ggacggactt aacgtgagac ttaacgacag agtgatcgag	900
tctctttgcg accttgcttg ccttgctgac agacttgctt ctatcatcaa gcacccacac	960
gacgctgaga aggcttctct tcaggacctt ctttattctc tttctgacgg agagcttaag	1020
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gtgatggagg ctcaccagga gcttgactat cagccacttc tttatcttcc aactggagtg	1140
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agagacggaa agggatatgaa gtatgctgac tattattctc agttcttcga cgacgctgga	1320
cttatgagag ctgctcttaa cgctactctt agaatccttg gagacaacaa ggcttctgtg	1380
gctagatcta gaggagagaa cttatcaag ttccagcagc agggagtgct tccaactgac	1440
tatgacttcc actgcgagga cgacatcaga atcgacagac ttgctgagtt cggagacgtg	1500
gtgactagaa agatctgggg agacagactt gagaagatcg agcaggctag aaagcttcag	1560
aagaaccttc cagctccacc agaccttgac cttatctctg agatcgctca ctattggaac	1620
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agacagcttc tttgctctat ctctcactct ccatattctg tgtctgagca gatggagtct	2040
gctgtgcttt tctctccaca ggtgtatact aacaagcaga tgcttgctgg atctaacgct	2100
aagagaaaca tctcttctat cgctggaact gagatgatgc ttagacagat cttatgaac	2160
cagactcagg ctgtgggaaa gagattcgag gacggaaagt atagatatct ttatttctat	2220

Sequence Listing.txt

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ccaacttatt atttcactcc agagactaac tctttccttc agaaggctta tgctaacatc 2280
gctcagacta gattcgactc ttctatcaag cttcacttcg tggacaagaa ccttgtggct 2340
aacttcgaca gaactagata tcagtctgtg gactctttcc ttatcgacga gaagcttaga 2400
cagaagaagg agactatcaa cgaggaggag gacggaaaga aggacagaac tttcaagctt 2460
tcttatccag aggacaagcc acttactttc tatttcatgg ctcttccacc aggaagaaac 2520
ccaactgaca ctgagtcttg ggtaatgcca gcttggcttg gacttgcttt cccaatgatc 2580
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gagtctttcg agtctgacag agctagactt gctggaagac agcttaacat catcagagac 3420
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ccacttgaca cttctaactc ttcttctgag gaggaggag 3519

```

```

<210> 38
<211> 35
<212> DNA
<213> Nicotiana benthamiana

```

```

<400> 38

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Sequence Listing.txt

tgggtggttt gtctacagca aaatatctgg cagat 35

<210> 39
 <211> 35
 <212> DNA
 <213> Nicotiana benthamiana

<400> 39
 aaatttgcta ttggactctt gccagcaatg cttgg 35

<210> 40
 <211> 35
 <212> DNA
 <213> Solanum lycopersicum

<400> 40
 tacctggatc tcagtctccc gaaagaggtg aggag 35

<210> 41
 <211> 811
 <212> DNA
 <213> Artificial

<220>
 <223> Cytomegalovirus enhancer + universal chicken beta-actin gene hybrid promoter

<400> 41
 cgttacataa cttacggtaa atggcccgcc tggctgaccg cccaacgacc cccgcccatt 60
 gacgtcaata gtaacgcaa tagggacttt ccattgacgt caatgggtgg agtattttacg 120
 gtaaaactgcc cacttggcag tacatcaagt gtatcatatg ccaagtacgc cccctattga 180
 cgtcaatgac ggtaaattggc cgcctggca ttgtgccag tacatgacct tatgggactt 240
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 gctccgccgc cgcctcgcgc cgcccgcccc ggctctgact gaccgcgtta ctcccacagg 660

Sequence Listing.txt

tgagcgggcg ggacggccct tctcctccgg gctgtaatta gctgagcaag aggtaagggt	720
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tcactttttt tcaggttgga ccggtgccac c	811

<210> 42
 <211> 223
 <212> DNA
 <213> Artificial

<220>
 <223> Bovine-derived growth hormone gene terminator sequence

<400> 42	
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tgccttcctt gaccctggaa ggtgccactc ccactgtcct ttcctaataa aatgaggaaa	120
ttgcatcgca ttgtctgagt aggtgtcatt ctattctggg ggggtggggtg gggcaggaca	180
gcaaggggga ggattgggaa gagaatagca ggcattgctgg gga	223

<210> 43
 <211> 249
 <212> DNA
 <213> Artificial

<220>
 <223> Human U6 snRNA gene promoter

<400> 43	
gagggcctat ttcccatgat tccttcatat ttgcatatac gatacaaggc tgttagagag	60
ataattggaa ttaatttgac tgtaaacaca aagatattag tacaaaatac gtgacgtaga	120
aagtaataat ttcttgggta gtttgcagtt ttaaaattat gttttaaaat ggactatcat	180
atgcttaccg taacttgaaa gtatttcgat ttcttggctt tatatatcct gtggaaagga	240
cgaaacacc	249

<210> 44
 <211> 35
 <212> DNA
 <213> Homo sapiens

<400> 44

Sequence Listing.txt

ccagaaccgg aggacaaagt acaaacggca gaagc 35

<210> 45

<211> 35

<212> DNA

<213> Homo sapiens

<400> 45

gatgtgatgg gagcccttct tcttctgctc ggact 35