SEQUENCE LISTING

<110> University of Florida Research Foundation, Inc.

<120> CAPSID-MODIFIED, RAAV3 VECTOR COMPOSITIONS AND METHODS OF USE IN GENE THERAPY OF HUMAN LIVER CANCER

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<160> 27

<170> PatentIn version 3.5

<210> 1
<211> 728
<212> PRT
<213> Adeno-associated virus serotype 1

<400> 1

Ala Ala Asp Gly Tyr Leu Pro Asp Trp Leu Glu Asp Asn Leu Ser Glu
1 5 10 15

Gly Ile Arg Glu Trp Trp Asp Leu Lys Pro Gly Ala Pro Lys Pro Lys
20 25 30

Ala Asn Gln Gln Lys Gln Asp Asp Gly Arg Gly Leu Val Leu Pro Gly
35 40 45

Tyr Lys Tyr Leu Gly Pro Phe Asn Gly Leu Asp Lys Gly Glu Pro Val
50 55 60

Asn Ala Ala Asp Ala Ala Ala Leu Glu His Asp Lys Ala Tyr Asp Gln
65 70 75 80

Gln Leu Lys Ala Gly Asp Asn Pro Tyr Leu Arg Tyr Asn His Ala Asp
85 90 95

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

Gly Arg Ala Val Phe Gln Ala Lys Lys Arg Val Leu Glu Pro Leu Gly
115 120 125

```
Leu Val Glu Glu Gly Ala Lys Thr Ala Pro Gly Lys Lys Arg Pro Val
    130                 135                 140

Glu Gln Ser Pro Gln Glu Pro Asp Ser Ser Ser Gly Ile Gly Lys Thr
145                 150                 155                 160

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

Ser Glu Ser Val Pro Asp Pro Gln Pro Leu Gly Glu Pro Pro Ala Thr
            180                 185                 190

Pro Ala Ala Val Gly Thr Thr Met Ala Ser Gly Gly Gly Ala Pro Met
        195                 200                 205

Ala Asp Asn Asn Glu Gly Ala Asp Gly Val Gly Asn Ala Ser Gly Asn
    210                 215                 220

Trp His Cys Asp Ser Thr Trp Leu Gly Asp Arg Val Ile Thr Thr Ser
225                 230                 235                 240

Thr Arg Thr Trp Ala Leu Pro Thr Tyr Asn Asn His Leu Tyr Lys Gln
                245                 250                 255

Ile Ser Ser Ala Ser Thr Gly Ala Ser Asn Asp Asn His Tyr Phe Gly
            260                 265                 270

Tyr Ser Thr Pro Trp Gly Tyr Phe Asp Phe Asn Arg Phe His Cys His
        275                 280                 285

Phe Ser Pro Arg Asp Trp Gln Leu Ile Asn Asn Asn Trp Gly Phe Arg
    290                 295                 300

Pro Lys Arg Leu Asn Phe Lys Leu Phe Asn Ile Gln Val Lys Glu Val
305                 310                 315                 320

Thr Thr Asn Asp Gly Val Thr Thr Ile Ala Asn Asn Leu Thr Ser Thr
                325                 330                 335

Val Gln Val Phe Ser Asp Ser Glu Tyr Gln Leu Pro Tyr Val Leu Gly
            340                 345                 350

Ser Ala His Gln Gly Cys Leu Pro Pro Phe Pro Ala Asp Val Phe Met
        355                 360                 365

Ile Pro Gln Tyr Gly Tyr Leu Thr Leu Asn Asn Gly Ser Gln Ala Val
    370                 375                 380

Gly Arg Ser Ser Phe Tyr Cys Glu Tyr Phe Pro Ser Gln Met Leu Arg
385                 390                 395                 400
```

Thr Gly Asn Asn Phe Thr Phe Ser Tyr Thr Phe Glu Glu Val Pro Phe
405 410 415

His Ser Ser Tyr Ala His Ser Gln Ser Leu Asp Arg Leu Met Asn Pro
420 425 430

Leu Ile Asp Gln Tyr Leu Tyr Tyr Leu Asn Arg Thr Gln Asn Gln Ser
435 440 445

Gly Ser Ala Gln Asn Lys Asp Leu Leu Phe Ser Arg Gly Ser Pro Ala
450 455 460

Gly Met Ser Val Gln Pro Lys Asn Trp Leu Pro Gly Pro Cys Tyr Arg
465 470 475 480

Gln Gln Arg Val Ser Lys Thr Lys Thr Asn Asn Asn Ser Asn Phe Thr
485 490 495

Trp Thr Gly Ala Ser Lys Tyr Asn Leu Asn Gly Arg Glu Ser Ile Ile
500 505 510

Asn Pro Gly Thr Ala Met Ala Ser His Lys Asp Asp Glu Asp Lys Phe
515 520 525

Phe Pro Met Ser Gly Val Met Ile Phe Gly Lys Glu Ser Ala Gly Ala
530 535 540

Ser Asn Thr Ala Leu Asp Asn Val Met Ile Thr Asp Glu Glu Glu Ile
545 550 555 560

Lys Ala Thr Asn Pro Val Ala Thr Glu Arg Phe Gly Thr Val Ala Val
565 570 575

Asn Phe Gln Ser Ser Thr Asp Pro Ala Thr Gly Asp Val His Ala Met
580 585 590

Gly Ala Leu Pro Gly Met Val Trp Gln Asp Arg Asp Val Tyr Leu Gln
595 600 605

Gly Pro Ile Trp Ala Lys Ile Pro His Thr Asp Gly His Phe His Pro
610 615 620

Ser Pro Leu Met Gly Gly Phe Gly Leu Lys Asn Pro Pro Pro Gln Ile
625 630 635 640

Leu Ile Lys Asn Thr Pro Val Pro Ala Asn Pro Pro Ala Glu Phe Ser
645 650 655

Ala Thr Lys Phe Ala Ser Phe Ile Thr Gln Tyr Ser Thr Gly Gln Val
660 665 670

Ser Val Glu Ile Glu Trp Glu Gln Lys Glu Asn Ser Lys Arg Trp Asn

675 680 685

Pro Glu Val Gln Tyr Thr Ser Asn Tyr Ala Lys Ser Ala Asn Val Asp
690 695 700

Phe Thr Val Asp Asn Asn Gly Leu Tyr Thr Glu Pro Arg Pro Ile Gly
705 710 715 720

Thr Arg Tyr Leu Thr Arg Pro Leu
725

<210> 2
<211> 727
<212> PRT
<213> Adeno-associated virus serotype 2

<400> 2

Ala Ala Asp Gly Tyr Leu Pro Asp Trp Leu Glu Asp Thr Leu Ser Glu
1 5 10 15

Gly Ile Arg Gln Trp Trp Lys Leu Lys Pro Gly Pro Pro Pro Pro Lys
20 25 30

Pro Ala Glu Arg His Lys Asp Asp Ser Arg Gly Leu Val Leu Pro Gly
35 40 45

Tyr Lys Tyr Leu Gly Pro Phe Asn Gly Leu Asp Lys Gly Glu Pro Val
50 55 60

Asn Glu Ala Asp Ala Ala Ala Leu Glu His Asp Lys Ala Tyr Asp Arg
65 70 75 80

Gln Leu Asp Ser Gly Asp Asn Pro Tyr Leu Lys Tyr Asn His Ala Asp
85 90 95

Ala Glu Phe Glu Arg Leu Lys Glu Asp Thr Ser Phe Gly Gly Asn Leu
100 105 110

Gly Arg Ala Val Phe Gln Ala Lys Lys Arg Val Leu Glu Pro Leu Gly
115 120 125

Leu Val Glu Glu Pro Val Lys Thr Ala Pro Gly Lys Lys Arg Pro Val
130 135 140

Glu His Ser Pro Val Glu Pro Asp Ser Ser Ser Gly Thr Gly Lys Ala
145 150 155 160

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

Ala Asp Ser Val Pro Asp Pro Gln Pro Leu Gly Gln Pro Pro Ala Ala
180 185 190

```
Pro Ser Gly Leu Gly Asn Thr Met Ala Thr Gly Ser Gly Ala Pro Met
        195                 200                 205

Ala Asp Asn Asn Glu Gly Ala Asp Gly Val Gly Asn Ser Ser Gly Asn
    210                 215                 220

Trp His Cys Asp Ser Thr Trp Met Gly Asp Arg Val Ile Thr Thr Ser
225                 230                 235                 240

Thr Arg Thr Trp Ala Leu Pro Thr Tyr Asn Asn His Leu Tyr Lys Gln
                245                 250                 255

Ile Ser Ser Gln Ser Gly Ala Ser Asn Asp Asn His Tyr Phe Gly Tyr
            260                 265                 270

Ser Thr Pro Trp Gly Tyr Phe Asp Phe Asn Arg Phe His Cys His Phe
        275                 280                 285

Ser Pro Arg Asp Trp Gln Leu Ile Asn Asn Asn Trp Gly Phe Arg Pro
    290                 295                 300

Lys Arg Leu Asn Phe Lys Leu Phe Asn Ile Gln Val Lys Glu Val Thr
305                 310                 315                 320

Gln Asn Asp Gly Thr Thr Thr Ile Ala Asn Asn Leu Thr Ser Thr Val
                325                 330                 335

Gln Val Phe Thr Asp Ser Glu Tyr Gln Leu Pro Tyr Val Leu Gly Ser
            340                 345                 350

Ala His Gln Gly Cys Leu Pro Pro Phe Pro Ala Asp Val Phe Met Val
        355                 360                 365

Pro Gln Tyr Gly Tyr Leu Thr Leu Asn Asn Gly Ser Gln Ala Val Gly
    370                 375                 380

Arg Ser Ser Phe Tyr Cys Glu Tyr Phe Pro Ser Gln Met Leu Arg Thr
385                 390                 395                 400

Gly Asn Asn Phe Thr Phe Ser Tyr Thr Phe Glu Asp Val Pro Phe His
                405                 410                 415

Ser Ser Tyr Ala His Ser Gln Ser Leu Asp Arg Leu Met Asn Pro Leu
            420                 425                 430

Ile Asp Gln Tyr Leu Tyr Tyr Leu Ser Arg Thr Asn Thr Pro Ser Gly
        435                 440                 445

Thr Thr Thr Gln Ser Arg Leu Gln Phe Ser Gln Ala Gly Ala Ser Asp
    450                 455                 460
```

```
Ile Arg Asp Gln Ser Arg Asn Trp Leu Pro Gly Pro Cys Tyr Arg Gln
465                 470                 475                 480

Gln Arg Val Ser Lys Thr Ser Ala Asn Asn Asn Ser Glu Tyr Ser Trp
                485                 490                 495

Thr Gly Ala Thr Lys Tyr His Leu Asn Gly Arg Asp Ser Leu Val Asn
            500                 505                 510

Pro Gly Pro Ala Met Ala Ser His Lys Asp Asp Glu Glu Lys Phe Phe
        515                 520                 525

Pro Gln Ser Gly Val Leu Ile Phe Gly Lys Gln Gly Ser Glu Lys Thr
    530                 535                 540

Asn Val Asp Ile Glu Lys Val Met Ile Thr Asp Glu Glu Glu Ile Arg
545                 550                 555                 560

Thr Thr Asn Pro Val Ala Thr Glu Gln Tyr Gly Ser Val Ser Thr Asn
                565                 570                 575

Leu Gln Arg Asn Arg Gln Ala Ala Thr Ala Asp Val Asn Thr Gln Gly
            580                 585                 590

Val Leu Pro Gly Met Val Trp Gln Asp Arg Asp Val Tyr Leu Gln Gly
        595                 600                 605

Pro Ile Trp Ala Lys Ile Pro His Thr Asp Gly His Phe His Pro Ser
    610                 615                 620

Pro Leu Met Gly Gly Phe Gly Leu Lys His Pro Pro Pro Gln Ile Leu
625                 630                 635                 640

Ile Lys Asn Thr Pro Val Pro Ala Asn Pro Ser Thr Thr Phe Ser Ala
                645                 650                 655

Ala Lys Phe Ala Ser Phe Ile Thr Gln Tyr Ser Thr Gly Gln Val Ser
            660                 665                 670

Val Glu Ile Glu Trp Glu Gln Lys Glu Asn Ser Lys Arg Trp Asn Pro
        675                 680                 685

Glu Ile Gln Tyr Thr Ser Asn Tyr Asn Lys Ser Val Asn Val Asp Phe
    690                 695                 700

Thr Val Asp Thr Asn Gly Val Tyr Ser Glu Pro Arg Pro Ile Gly Thr
705                 710                 715                 720

Arg Tyr Leu Thr Arg Asn Leu
                725
```

<210> 3

<211> 728
<212> PRT
<213> Adeno-associated virus serotype 3

<400> 3

Ala Ala Asp Gly Tyr Leu Pro Asp Trp Leu Glu Asp Asn Leu Ser Glu
1 5 10 15

Gly Ile Arg Glu Trp Trp Ala Leu Lys Pro Gly Val Pro Gln Pro Lys
20 25 30

Ala Asn Gln Gln His Gln Asp Asn Arg Arg Gly Leu Val Leu Pro Gly
35 40 45

Tyr Lys Tyr Leu Gly Pro Gly Asn Gly Leu Asp Lys Gly Glu Pro Val
50 55 60

Asn Glu Ala Asp Ala Ala Ala Leu Glu His Asp Lys Ala Tyr Asp Gln
65 70 75 80

Gln Leu Lys Ala Gly Asp Asn Pro Tyr Leu Lys Tyr Asn His Ala Asp
85 90 95

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

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

Leu Val Glu Glu Ala Ala Lys Thr Ala Pro Gly Lys Lys Gly Ala Val
130 135 140

Asp Gln Ser Pro Gln Glu Pro Asp Ser Ser Ser Gly Val Gly Lys Ser
145 150 155 160

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

Ser Glu Ser Val Pro Asp Pro Gln Pro Leu Gly Glu Pro Pro Ala Ala
180 185 190

Pro Thr Ser Leu Gly Asn Thr Met Ala Ser Gly Gly Gly Ala Pro Met
195 200 205

Ala Asp Asn Asn Glu Gly Ala Asp Gly Val Gly Asn Ser Ser Gly Asn
210 215 220

Trp His Cys Asp Ser Gln Trp Leu Gly Asp Arg Val Ile Thr Thr Ser
225 230 235 240

Thr Arg Thr Trp Ala Leu Pro Thr Tyr Asn Asn His Leu Tyr Lys Gln
245 250 255

```
Ile Ser Ser Gln Ser Gly Ala Ser Asn Asp Asn His Tyr Phe Gly Tyr
            260                 265                 270

Ser Thr Pro Trp Gly Tyr Phe Asp Phe Asn Arg Phe His Cys His Phe
        275                 280                 285

Ser Pro Arg Asp Trp Gln Leu Ile Asn Asn Asn Trp Gly Phe Arg Pro
    290                 295                 300

Lys Lys Leu Ser Phe Lys Leu Phe Asn Ile Gln Val Arg Gly Val Thr
305                 310                 315                 320

Gln Asn Asp Gly Thr Thr Thr Ile Ala Asn Asn Leu Thr Ser Thr Val
                325                 330                 335

Gln Val Phe Thr Asp Ser Glu Tyr Gln Leu Pro Tyr Val Leu Gly Ser
            340                 345                 350

Ala His Gln Gly Cys Leu Pro Pro Phe Pro Ala Asp Val Phe Met Val
        355                 360                 365

Pro Gln Tyr Gly Tyr Leu Thr Leu Asn Asn Gly Ser Gln Ala Val Gly
    370                 375                 380

Arg Ser Ser Phe Tyr Cys Glu Tyr Phe Pro Ser Gln Met Leu Arg Thr
385                 390                 395                 400

Gly Asn Asn Phe Gln Phe Ser Tyr Thr Phe Glu Asp Val Pro Phe His
                405                 410                 415

Ser Ser Tyr Ala His Ser Gln Ser Leu Asp Arg Leu Met Asn Pro Leu
            420                 425                 430

Ile Asp Gln Tyr Leu Tyr Tyr Leu Asn Arg Thr Gln Gly Thr Thr Ser
        435                 440                 445

Gly Thr Thr Asn Gln Ser Arg Leu Leu Phe Ser Gln Ala Gly Pro Gln
    450                 455                 460

Ser Met Ser Leu Gln Ala Arg Asn Trp Leu Pro Gly Pro Cys Tyr Arg
465                 470                 475                 480

Gln Gln Arg Leu Ser Lys Thr Ala Asn Asn Asn Asn Ser Asn Phe Pro
                485                 490                 495

Trp Thr Ala Ala Ser Lys Tyr His Leu Asn Gly Arg Asp Ser Leu Val
            500                 505                 510

Asn Pro Gly Pro Ala Met Ala Ser His Lys Asp Asp Glu Glu Lys Phe
        515                 520                 525
```

```
Phe Pro Met His Gly Asn Leu Ile Phe Gly Lys Glu Gly Thr Thr Ala
    530                 535                 540

Ser Asn Ala Glu Leu Asp Asn Val Met Ile Thr Asp Glu Glu Glu Ile
545                 550                 555                 560

Arg Thr Thr Asn Pro Val Ala Thr Glu Gln Tyr Gly Thr Val Ala Asn
                565                 570                 575

Asn Leu Gln Ser Asn Thr Ala Pro Thr Thr Gly Thr Val Asn His Gln
            580                 585                 590

Gly Ala Leu Pro Gly Met Val Trp Gln Asp Arg Asp Val Tyr Leu Gln
        595                 600                 605

Gly Pro Ile Trp Ala Lys Ile Pro His Thr Asp Gly His Phe His Pro
    610                 615                 620

Ser Pro Leu Met Gly Gly Phe Gly Leu Lys His Pro Pro Pro Gln Ile
625                 630                 635                 640

Met Ile Lys Asn Thr Pro Val Pro Ala Asn Pro Pro Thr Thr Phe Ser
                645                 650                 655

Pro Ala Lys Phe Ala Ser Phe Ile Thr Gln Tyr Ser Thr Gly Gln Val
            660                 665                 670

Ser Val Glu Ile Glu Trp Glu Gln Lys Glu Asn Ser Lys Arg Trp Asn
        675                 680                 685

Pro Glu Ile Gln Tyr Thr Ser Asn Tyr Asn Lys Ser Val Asn Val Asp
    690                 695                 700

Phe Thr Val Asp Thr Asn Gly Val Tyr Ser Glu Pro Arg Pro Ile Gly
705                 710                 715                 720

Thr Arg Tyr Leu Thr Arg Asn Leu
                725
```

<210> 4
<211> 727
<212> PRT
<213> Adeno-associated virus serotype 4

<400> 4

```
Met Thr Asp Gly Tyr Leu Pro Asp Trp Leu Glu Asp Asn Leu Ser Glu
1               5                   10                  15

Gly Val Arg Glu Trp Trp Ala Leu Gln Pro Gly Ala Pro Lys Pro Lys
            20                  25                  30

Ala Asn Gln Gln His Gln Asp Asn Ala Arg Gly Leu Val Leu Pro Gly
        35                  40                  45
```

```
Tyr Lys Tyr Leu Gly Pro Gly Asn Gly Leu Asp Lys Gly Glu Pro Val
    50                  55                  60

Asn Ala Ala Asp Ala Ala Ala Leu Glu His Asp Lys Ala Tyr Asp Gln
65                  70                  75                  80

Gln Leu Lys Ala Gly Asp Asn Pro Tyr Leu Lys Tyr Asn His Ala Asp
                85                  90                  95

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

Gly Arg Ala Val Phe Gln Ala Lys Lys Arg Val Leu Glu Pro Leu Gly
        115                 120                 125

Leu Val Glu Gln Ala Gly Glu Thr Ala Pro Gly Lys Lys Arg Pro Leu
    130                 135                 140

Ile Glu Ser Pro Gln Gln Pro Asp Ser Ser Thr Gly Ile Gly Lys Lys
145                 150                 155                 160

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

Ala Gly Asp Gly Pro Pro Glu Gly Ser Thr Ser Gly Ala Met Ser Asp
            180                 185                 190

Asp Ser Met Arg Ala Ala Ala Gly Gly Ala Ala Val Glu Gly Gly Gln
        195                 200                 205

Gly Ala Asp Gly Val Gly Asn Ala Ser Gly Asp Trp His Cys Asp Ser
    210                 215                 220

Thr Trp Ser Glu Gly His Val Thr Thr Thr Ser Thr Arg Thr Trp Val
225                 230                 235                 240

Leu Pro Thr Tyr Asn Asn His Leu Tyr Lys Arg Leu Gly Glu Ser Leu
                245                 250                 255

Gln Ser Asn Thr Tyr Asn Gly Phe Ser Thr Pro Trp Gly Tyr Phe Asp
            260                 265                 270

Phe Asn Arg Phe His Cys His Phe Ser Pro Arg Asp Trp Gln Leu Ile
        275                 280                 285

Asn Asn Asn Trp Gly Met Arg Pro Lys Ala Met Arg Val Lys Ile Phe
    290                 295                 300

Asn Ile Gln Val Lys Glu Val Thr Thr Ser Asn Gly Glu Thr Thr Val
305                 310                 315                 320
```

```
Ala Asn Asn Leu Thr Ser Thr Val Gln Ile Phe Ala Asp Ser Ser Tyr
                325                 330                 335

Glu Leu Pro Tyr Val Met Asp Ala Gly Gln Glu Gly Ser Leu Pro Pro
            340                 345                 350

Phe Pro Asn Asp Val Phe Met Val Pro Gln Tyr Gly Tyr Cys Gly Leu
        355                 360                 365

Val Thr Gly Asn Thr Ser Gln Gln Gln Thr Asp Arg Asn Ala Phe Tyr
    370                 375                 380

Cys Glu Tyr Phe Pro Ser Gln Met Leu Arg Thr Gly Asn Asn Phe Glu
385                 390                 395                 400

Ile Thr Tyr Ser Phe Glu Lys Val Pro Phe His Ser Met Tyr Ala His
                405                 410                 415

Ser Gln Ser Leu Asp Arg Leu Met Asn Pro Leu Ile Asp Gln Tyr Leu
            420                 425                 430

Trp Gly Leu Gln Ser Thr Thr Thr Gly Thr Thr Leu Asn Ala Gly Thr
        435                 440                 445

Ala Thr Thr Asn Phe Thr Lys Leu Arg Pro Thr Asn Phe Ser Asn Phe
    450                 455                 460

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

Lys Thr Ala Asn Asn Tyr Lys Ile Pro Ala Thr Gly Ser Asp Ser Leu
                485                 490                 495

Ile Lys Tyr Glu Thr His Ser Thr Leu Asp Gly Arg Trp Ser Ala Leu
            500                 505                 510

Thr Pro Gly Pro Pro Met Ala Thr Ala Gly Pro Ala Asp Ser Lys Phe
        515                 520                 525

Ser Asn Ser Gln Leu Ile Phe Ala Gly Pro Lys Gln Asn Gly Asn Thr
    530                 535                 540

Ala Thr Val Pro Gly Thr Leu Ile Phe Thr Ser Glu Glu Glu Leu Ala
545                 550                 555                 560

Ala Thr Asn Ala Thr Asp Thr Asp Met Trp Gly Asn Leu Pro Gly Gly
                565                 570                 575

Asp Gln Ser Ser Asn Leu Pro Thr Val Asp Arg Leu Thr Ala Leu Gly
            580                 585                 590
```

```
Ala Val Pro Gly Met Val Trp Gln Asn Arg Asp Ile Tyr Tyr Gln Gly
        595                 600                 605

Pro Ile Trp Ala Lys Ile Pro His Thr Asp Gly His Phe His Pro Ser
    610                 615                 620

Pro Leu Ile Gly Gly Phe Gly Leu Lys His Pro Pro Pro Gln Ile Phe
625                 630                 635                 640

Ile Lys Asn Thr Pro Val Pro Ala Asn Pro Ala Thr Thr Phe Ser Ser
                645                 650                 655

Thr Pro Val Asn Ser Phe Ile Thr Gln Tyr Ser Thr Gly Gln Val Ser
            660                 665                 670

Val Gln Ile Asp Trp Glu Gln Lys Glu Arg Ser Lys Arg Trp Asn Pro
        675                 680                 685

Glu Val Gln Phe Thr Ser Asn Tyr Gly Gln Gln Asn Ser Leu Leu Trp
    690                 695                 700

Ala Pro Asp Ala Ala Gly Lys Tyr Thr Glu Pro Arg Ala Ile Gly Thr
705                 710                 715                 720

Arg Tyr Leu Thr His His Leu
                725
```

<210> 5
<211> 716
<212> PRT
<213> Adeno-associated virus serotype 5

<400> 5

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Ser Phe Val Asp His Pro Pro Asp Trp Leu Glu Glu Val Gly Glu Gly
1               5                   10                  15

Leu Arg Glu Phe Leu Gly Leu Glu Ala Gly Pro Pro Lys Pro Lys Pro
            20                  25                  30

Asn Gln Gln His Gln Asp Gln Ala Arg Gly Leu Val Leu Pro Gly Tyr
        35                  40                  45

Asn Tyr Leu Gly Pro Gly Asn Gly Leu Asp Arg Gly Glu Pro Val Asn
    50                  55                  60

Arg Ala Asp Glu Val Ala Arg Glu His Asp Ile Ser Tyr Asn Glu Gln
65                  70                  75                  80

Leu Glu Ala Gly Asp Asn Pro Tyr Leu Lys Tyr Asn His Ala Asp Ala
                85                  90                  95

Glu Phe Glu Lys Leu Ala Asp Asp Thr Ser Phe Gly Gly Asn Leu Gly
            100                 105                 110
```

```
Lys Ala Val Phe Gln Ala Lys Lys Arg Val Leu Glu Pro Phe Gly Leu
        115                 120                 125

Val Glu Glu Gly Ala Lys Thr Ala Pro Thr Gly Lys Arg Ile Asp Asp
    130                 135                 140

His Phe Pro Lys Arg Lys Lys Ala Arg Thr Glu Glu Asp Ser Lys Pro
145                 150                 155                 160

Ser Thr Ser Ser Asp Ala Glu Ala Gly Pro Ser Gly Ser Gln Gln Leu
                165                 170                 175

Gln Ile Pro Ala Gln Pro Ala Ser Ser Leu Gly Asp Thr Met Ser Ala
            180                 185                 190

Gly Gly Gly Gly Pro Leu Gly Asp Asn Asn Gln Gly Ala Asp Gly Val
        195                 200                 205

Gly Asn Ala Ser Gly Asp Trp His Cys Asp Ser Thr Trp Met Gly Asp
    210                 215                 220

Arg Val Val Thr Lys Ser Thr Arg Thr Trp Val Leu Pro Ser Tyr Asn
225                 230                 235                 240

Asn His Gln Tyr Arg Glu Ile Lys Ser Gly Ser Val Asp Gly Ser Asn
                245                 250                 255

Ala Asn Ala Tyr Phe Gly Tyr Ser Thr Pro Trp Gly Tyr Phe Asp Phe
            260                 265                 270

Asn Arg Phe His Ser His Trp Ser Pro Arg Asp Trp Gln Leu Ile Asn
        275                 280                 285

Asn Tyr Trp Gly Phe Arg Pro Arg Ser Leu Arg Val Lys Ile Phe Asn
    290                 295                 300

Ile Gln Val Lys Glu Val Thr Val Gln Asp Ser Thr Thr Thr Ile Ala
305                 310                 315                 320

Asn Asn Leu Thr Ser Thr Val Gln Val Phe Thr Asp Asp Asp Tyr Gln
                325                 330                 335

Leu Pro Tyr Val Val Gly Asn Gly Thr Glu Gly Cys Leu Pro Ala Phe
            340                 345                 350

Pro Pro Gln Val Phe Thr Leu Pro Gln Tyr Gly Tyr Ala Thr Leu Asn
        355                 360                 365

Arg Asp Asn Thr Glu Asn Pro Thr Glu Arg Ser Ser Phe Phe Cys Glu
    370                 375                 380
```

```
Tyr Phe Pro Ser Lys Met Leu Arg Thr Gly Asn Asn Phe Glu Phe Thr
385                 390                 395                 400

Tyr Asn Phe Glu Glu Val Pro Phe His Ser Ser Phe Ala Pro Ser Gln
                405                 410                 415

Asn Leu Phe Lys Leu Ala Asn Pro Leu Val Asp Gln Tyr Leu Tyr Arg
            420                 425                 430

Phe Val Ser Thr Asn Asn Thr Gly Gly Val Gln Phe Asn Lys Asn Leu
        435                 440                 445

Ala Gly Arg Tyr Ala Asn Thr Tyr Lys Asn Trp Phe Pro Gly Pro Met
    450                 455                 460

Gly Arg Thr Gln Gly Trp Asn Leu Gly Ser Gly Asn Arg Ala Ser Val
465                 470                 475                 480

Ser Ala Phe Ala Thr Thr Asn Arg Met Glu Leu Glu Gly Ala Ser Tyr
                485                 490                 495

Gln Val Pro Pro Gln Pro Asn Gly Met Thr Asn Asn Leu Gln Gly Ser
            500                 505                 510

Asn Thr Tyr Ala Leu Glu Asn Thr Met Ile Phe Asn Ser Gln Pro Ala
        515                 520                 525

Asn Pro Gly Thr Thr Ala Thr Tyr Leu Glu Gly Asn Met Leu Ile Thr
    530                 535                 540

Ser Glu Ser Glu Thr Gln Pro Val Asn Arg Val Ala Tyr Asn Val Gly
545                 550                 555                 560

Gly Gln Met Ala Thr Asn Asn Gln Ser Thr Thr Ala Pro Ala Thr Gly
                565                 570                 575

Thr Tyr Asn Leu Gln Glu Ile Val Pro Gly Ser Val Trp Met Glu Arg
            580                 585                 590

Asp Val Tyr Leu Gln Gly Pro Ile Trp Ala Lys Ile Pro Glu Thr Gly
        595                 600                 605

Ala His Phe His Pro Ser Pro Ala Met Gly Gly Phe Gly Leu Lys His
    610                 615                 620

Pro Pro Pro Met Met Leu Ile Lys Asn Thr Pro Val Pro Gly Asn Ile
625                 630                 635                 640

Thr Ser Phe Ser Asp Val Pro Val Ser Ser Phe Ile Thr Gln Tyr Ser
                645                 650                 655
```

```
Thr Gly Gln Val Thr Val Glu Met Glu Trp Glu Lys Lys Glu Asn Ser
            660                 665                 670

Lys Arg Trp Asn Pro Glu Ile Gln Tyr Thr Asn Asn Tyr Asn Asp Pro
        675                 680                 685

Gln Phe Val Asp Phe Ala Pro Asp Ser Thr Gly Glu Tyr Arg Thr Thr
    690                 695                 700

Arg Pro Ile Gly Thr Arg Tyr Leu Thr Arg Pro Leu
705                 710                 715
```

<210> 6
<211> 728
<212> PRT
<213> Adeno-associated virus serotype 6

<400> 6

```
Ala Ala Asp Gly Tyr Leu Pro Asp Trp Leu Glu Asp Asn Leu Ser Glu
1               5                   10                  15

Gly Ile Arg Glu Trp Trp Asp Leu Lys Pro Gly Ala Pro Lys Pro Lys
            20                  25                  30

Ala Asn Gln Gln Lys Gln Asp Asp Gly Arg Gly Leu Val Leu Pro Gly
        35                  40                  45

Tyr Lys Tyr Leu Gly Pro Phe Asn Gly Leu Asp Lys Gly Glu Pro Val
    50                  55                  60

Asn Ala Ala Asp Ala Ala Ala Leu Glu His Asp Lys Ala Tyr Asp Gln
65                  70                  75                  80

Gln Leu Lys Ala Gly Asp Asn Pro Tyr Leu Arg Tyr Asn His Ala Asp
                85                  90                  95

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

Gly Arg Ala Val Phe Gln Ala Lys Lys Arg Val Leu Glu Pro Phe Gly
        115                 120                 125

Leu Val Glu Glu Gly Ala Lys Thr Ala Pro Gly Lys Lys Arg Pro Val
    130                 135                 140

Glu Gln Ser Pro Gln Glu Pro Asp Ser Ser Ser Gly Ile Gly Lys Thr
145                 150                 155                 160

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

Ser Glu Ser Val Pro Asp Pro Gln Pro Leu Gly Glu Pro Pro Ala Thr
            180                 185                 190
```

```
Pro Ala Ala Val Gly Thr Thr Met Ala Ser Gly Gly Gly Ala Pro Met
        195                 200                 205

Ala Asp Asn Asn Glu Gly Ala Asp Gly Val Gly Asn Ala Ser Gly Asn
    210                 215                 220

Trp His Cys Asp Ser Thr Trp Leu Gly Asp Arg Val Ile Thr Thr Ser
225                 230                 235                 240

Thr Arg Thr Trp Ala Leu Pro Thr Tyr Asn Asn His Leu Tyr Lys Gln
                245                 250                 255

Ile Ser Ser Ala Ser Thr Gly Ala Ser Asn Asp Asn His Tyr Phe Gly
            260                 265                 270

Tyr Ser Thr Pro Trp Gly Tyr Phe Asp Phe Asn Arg Phe His Cys His
        275                 280                 285

Phe Ser Pro Arg Asp Trp Gln Leu Ile Asn Asn Asn Trp Gly Phe Arg
    290                 295                 300

Pro Lys Arg Leu Asn Phe Lys Leu Phe Asn Ile Gln Val Lys Glu Val
305                 310                 315                 320

Thr Thr Asn Asp Gly Val Thr Thr Ile Ala Asn Asn Leu Thr Ser Thr
                325                 330                 335

Val Gln Val Phe Ser Asp Ser Glu Tyr Gln Leu Pro Tyr Val Leu Gly
            340                 345                 350

Ser Ala His Gln Gly Cys Leu Pro Pro Phe Pro Ala Asp Val Phe Met
        355                 360                 365

Ile Pro Gln Tyr Gly Tyr Leu Thr Leu Asn Asn Gly Ser Gln Ala Val
    370                 375                 380

Gly Arg Ser Ser Phe Tyr Cys Glu Tyr Phe Pro Ser Gln Met Leu Arg
385                 390                 395                 400

Thr Gly Asn Asn Phe Thr Phe Ser Tyr Thr Phe Glu Asp Val Pro Phe
                405                 410                 415

His Ser Ser Tyr Ala His Ser Gln Ser Leu Asp Arg Leu Met Asn Pro
            420                 425                 430

Leu Ile Asp Gln Tyr Leu Tyr Tyr Leu Asn Arg Thr Gln Asn Gln Ser
        435                 440                 445

Gly Ser Ala Gln Asn Lys Asp Leu Leu Phe Ser Arg Gly Ser Pro Ala
    450                 455                 460
```

```
Gly Met Ser Val Gln Pro Lys Asn Trp Leu Pro Gly Pro Cys Tyr Arg
465                 470                 475                 480

Gln Gln Arg Val Ser Lys Thr Lys Thr Asn Asn Asn Ser Asn Phe Thr
                485                 490                 495

Trp Thr Gly Ala Ser Lys Tyr Asn Leu Asn Gly Arg Glu Ser Ile Ile
            500                 505                 510

Asn Pro Gly Thr Ala Met Ala Ser His Lys Asp Asp Lys Asp Lys Phe
        515                 520                 525

Phe Pro Met Ser Gly Val Met Ile Phe Gly Lys Glu Ser Ala Gly Ala
    530                 535                 540

Ser Asn Thr Ala Leu Asp Asn Val Met Ile Thr Asp Glu Glu Glu Ile
545                 550                 555                 560

Lys Ala Thr Asn Pro Val Ala Thr Glu Arg Phe Gly Thr Val Ala Val
                565                 570                 575

Asn Leu Gln Ser Ser Thr Asp Pro Ala Thr Gly Asp Val His Val Met
            580                 585                 590

Gly Ala Leu Pro Gly Met Val Trp Gln Asp Arg Asp Val Tyr Leu Gln
        595                 600                 605

Gly Pro Ile Trp Ala Lys Ile Pro His Thr Asp Gly His Phe His Pro
    610                 615                 620

Ser Pro Leu Met Gly Gly Phe Gly Leu Lys His Pro Pro Pro Gln Ile
625                 630                 635                 640

Leu Ile Lys Asn Thr Pro Val Pro Ala Asn Pro Pro Ala Glu Phe Ser
                645                 650                 655

Ala Thr Lys Phe Ala Ser Phe Ile Thr Gln Tyr Ser Thr Gly Gln Val
            660                 665                 670

Ser Val Glu Ile Glu Trp Glu Gln Lys Glu Asn Ser Lys Arg Trp Asn
        675                 680                 685

Pro Glu Val Gln Tyr Thr Ser Asn Tyr Ala Lys Ser Ala Asn Val Asp
    690                 695                 700

Phe Thr Val Asp Asn Asn Gly Leu Tyr Thr Glu Pro Arg Pro Ile Gly
705                 710                 715                 720

Thr Arg Tyr Leu Thr Arg Pro Leu
                725
```

<210> 7
<211> 729
<212> PRT
<213> Adeno-associated virus serotype 7

<400> 7

```
Ala Ala Asp Gly Tyr Leu Pro Asp Trp Leu Glu Asp Asn Leu Ser Glu
1               5                  10                  15

Gly Ile Arg Glu Trp Trp Asp Leu Lys Pro Gly Ala Pro Lys Pro Lys
            20                  25                  30

Ala Asn Gln Gln Lys Gln Asp Asn Gly Arg Gly Leu Val Leu Pro Gly
        35                  40                  45

Tyr Lys Tyr Leu Gly Pro Phe Asn Gly Leu Asp Lys Gly Glu Pro Val
    50                  55                  60

Asn Ala Ala Asp Ala Ala Ala Leu Glu His Asp Lys Ala Tyr Asp Gln
65                  70                  75                  80

Gln Leu Lys Ala Gly Asp Asn Pro Tyr Leu Arg Tyr Asn His Ala Asp
                85                  90                  95

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

Gly Arg Ala Val Phe Gln Ala Lys Lys Arg Val Leu Glu Pro Leu Gly
        115                 120                 125

Leu Val Glu Glu Gly Ala Lys Thr Ala Pro Ala Lys Lys Arg Pro Val
    130                 135                 140

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

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

Asp Ser Glu Ser Val Pro Asp Pro Gln Pro Leu Gly Glu Pro Pro Ala
            180                 185                 190

Ala Pro Ser Ser Val Gly Gly Thr Val Ala Ala Gly Gly Gly Ala Pro
        195                 200                 205

Met Ala Asp Asn Asn Glu Gly Ala Asp Gly Val Gly Asn Ala Ser Gly
    210                 215                 220

Asn Trp His Cys Asp Ser Thr Trp Leu Gly Asp Arg Val Ile Thr Thr
225                 230                 235                 240

Ser Thr Arg Thr Trp Ala Leu Pro Thr Tyr Asn Asn His Leu Tyr Lys
                245                 250                 255
```

```
Gln Ile Ser Ser Glu Thr Ala Gly Ser Thr Asn Asp Asn Thr Tyr Phe
            260                 265                 270

Gly Tyr Ser Thr Pro Trp Gly Tyr Phe Asp Phe Asn Arg Phe His Cys
        275                 280                 285

His Phe Ser Pro Arg Asp Trp Gln Leu Ile Asn Asn Asn Trp Gly Phe
    290                 295                 300

Arg Pro Lys Lys Leu Arg Phe Lys Leu Phe Asn Ile Gln Val Lys Glu
305                 310                 315                 320

Val Thr Thr Asn Asp Gly Val Thr Thr Ile Ala Asn Asn Leu Thr Ser
                325                 330                 335

Thr Ile Gln Val Phe Ser Asp Ser Glu Tyr Gln Leu Pro Tyr Val Leu
            340                 345                 350

Gly Ser Ala His Gln Gly Cys Leu Pro Pro Phe Pro Ala Asp Val Phe
        355                 360                 365

Met Ile Pro Gln Tyr Gly Tyr Leu Thr Leu Asn Asn Gly Ser Gln Ser
    370                 375                 380

Val Gly Arg Ser Ser Phe Tyr Cys Glu Tyr Phe Pro Ser Gln Met Leu
385                 390                 395                 400

Arg Thr Gly Asn Asn Phe Glu Phe Ser Tyr Ser Phe Glu Asp Val Pro
                405                 410                 415

Phe His Ser Ser Tyr Ala His Ser Gln Ser Leu Asp Arg Leu Met Asn
            420                 425                 430

Pro Leu Ile Asp Gln Tyr Leu Tyr Tyr Leu Ala Arg Thr Gln Ser Asn
        435                 440                 445

Pro Gly Gly Thr Ala Gly Asn Arg Glu Leu Gln Phe Tyr Gln Gly Gly
    450                 455                 460

Pro Ser Thr Met Ala Glu Gln Ala Lys Asn Trp Leu Pro Gly Pro Cys
465                 470                 475                 480

Phe Arg Gln Gln Arg Val Ser Lys Thr Leu Asp Asn Asn Asn Ser Asn
                485                 490                 495

Phe Ala Trp Thr Gly Ala Thr Lys Tyr His Leu Asn Gly Arg Asn Ser
            500                 505                 510

Leu Val Asn Pro Gly Val Ala Met Ala Thr His Lys Asp Asp Glu Asp
        515                 520                 525
```

```
Arg Phe Phe Pro Ser Ser Gly Val Leu Ile Phe Gly Lys Thr Gly Ala
    530                 535                 540

Thr Asn Lys Thr Thr Leu Glu Asn Val Leu Met Thr Asn Glu Glu Glu
545                 550                 555                 560

Ile Arg Pro Thr Asn Pro Val Ala Thr Glu Glu Tyr Gly Ile Val Ser
                565                 570                 575

Ser Asn Leu Gln Ala Asn Thr Ala Ala Gln Thr Gln Val Val Asn Asn
            580                 585                 590

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

Gln Gly Pro Ile Trp Ala Lys Ile Pro His Thr Asp Gly Asn Phe His
    610                 615                 620

Pro Ser Pro Leu Met Gly Gly Phe Gly Leu Lys His Pro Pro Pro Gln
625                 630                 635                 640

Ile Leu Ile Lys Asn Thr Pro Val Pro Ala Asn Pro Pro Glu Val Phe
                645                 650                 655

Thr Pro Ala Lys Phe Ala Ser Phe Ile Thr Gln Tyr Ser Thr Gly Gln
            660                 665                 670

Val Ser Val Glu Ile Glu Trp Glu Gln Lys Glu Asn Ser Lys Arg Trp
        675                 680                 685

Asn Pro Glu Ile Gln Tyr Thr Ser Asn Phe Glu Lys Gln Thr Gly Val
    690                 695                 700

Asp Phe Ala Val Asp Ser Gln Gly Val Tyr Ser Glu Pro Arg Pro Ile
705                 710                 715                 720

Gly Thr Arg Tyr Leu Thr Arg Asn Leu
                725
```

<210> 8
<211> 730
<212> PRT
<213> Adeno-associated virus serotype 8

<400> 8

```
Ala Ala Asp Gly Tyr Leu Pro Asp Trp Leu Glu Asp Asn Leu Ser Glu
1               5                   10                  15

Gly Ile Arg Glu Trp Trp Ala Leu Lys Pro Gly Ala Pro Lys Pro Lys
            20                  25                  30

Ala Asn Gln Gln Lys Gln Asp Asp Gly Arg Gly Leu Val Leu Pro Gly
```

```
        35                  40                  45

Tyr Lys Tyr Leu Gly Pro Phe Asn Gly Leu Asp Lys Gly Glu Pro Val
    50                  55                  60

Asn Ala Ala Asp Ala Ala Ala Leu Glu His Asp Lys Ala Tyr Asp Gln
65                  70                  75                  80

Gln Leu Gln Ala Gly Asp Asn Pro Tyr Leu Arg Tyr Asn His Ala Asp
                85                  90                  95

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

Gly Arg Ala Val Phe Gln Ala Lys Lys Arg Val Leu Glu Pro Leu Gly
        115                 120                 125

Leu Val Glu Glu Gly Ala Lys Thr Ala Pro Gly Lys Lys Arg Pro Val
    130                 135                 140

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

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

Asp Ser Glu Ser Val Pro Asp Pro Gln Pro Leu Gly Glu Pro Pro Ala
            180                 185                 190

Ala Pro Ser Gly Val Gly Asn Thr Met Ala Ala Gly Gly Gly Ala Pro
        195                 200                 205

Met Ala Asp Asn Asn Glu Gly Ala Asp Gly Val Gly Ser Ser Ser Gly
    210                 215                 220

Asn Trp His Cys Asp Ser Thr Trp Leu Gly Asp Arg Val Ile Thr Thr
225                 230                 235                 240

Ser Thr Arg Thr Trp Ala Leu Pro Thr Tyr Asn Asn His Leu Tyr Lys
                245                 250                 255

Gln Ile Ser Asn Gly Thr Ser Gly Gly Ala Thr Asn Asp Asn Thr Tyr
            260                 265                 270

Phe Gly Tyr Ser Thr Pro Trp Gly Tyr Phe Asp Phe Asn Arg Phe His
        275                 280                 285

Cys His Phe Ser Pro Arg Asp Trp Gln Leu Ile Asn Asn Asn Trp Gly
    290                 295                 300

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

```
Glu Val Thr Gln Asn Glu Gly Thr Lys Thr Ile Ala Asn Asn Leu Thr
                325                 330                 335

Ser Thr Ile Gln Val Phe Thr Asp Ser Glu Tyr Gln Leu Pro Tyr Val
            340                 345                 350

Leu Gly Ser Ala His Gln Gly Cys Leu Pro Pro Phe Pro Ala Asp Val
        355                 360                 365

Phe Met Ile Pro Gln Tyr Gly Tyr Leu Thr Leu Asn Asn Gly Ser Gln
    370                 375                 380

Ala Val Gly Arg Ser Ser Phe Tyr Cys Glu Tyr Phe Pro Ser Gln Met
385                 390                 395                 400

Leu Arg Thr Gly Asn Asn Phe Gln Phe Thr Tyr Thr Phe Glu Asp Val
                405                 410                 415

Pro Phe His Ser Ser Tyr Ala His Ser Gln Ser Leu Asp Arg Leu Met
            420                 425                 430

Asn Pro Leu Ile Asp Gln Tyr Leu Tyr Tyr Leu Ser Arg Thr Gln Thr
        435                 440                 445

Thr Gly Gly Thr Ala Asn Thr Gln Thr Leu Gly Phe Ser Gln Gly Gly
    450                 455                 460

Pro Asn Thr Met Ala Asn Gln Ala Lys Asn Trp Leu Pro Gly Pro Cys
465                 470                 475                 480

Tyr Arg Gln Gln Arg Val Ser Thr Thr Thr Gly Asn Asn Asn Ser Asn
                485                 490                 495

Phe Ala Trp Thr Ala Gly Thr Lys Tyr His Leu Asn Gly Arg Asn Ser
            500                 505                 510

Leu Ala Asn Pro Gly Ile Ala Met Ala Thr His Lys Asp Asp Glu Glu
        515                 520                 525

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

Ala Arg Asp Asn Ala Asp Tyr Ser Asp Val Met Leu Thr Ser Glu Glu
545                 550                 555                 560

Glu Ile Lys Thr Thr Asn Pro Val Ala Thr Glu Glu Tyr Gly Ile Val
                565                 570                 575

Ala Asp Asn Leu Gln Gln Asn Thr Ala Pro Gln Ile Gly Thr Val Asn
            580                 585                 590
```

```
Ser Gln Gly Ala Leu Pro Gly Met Val Trp Gln Asn Arg Asp Val Tyr
        595                 600                 605

Leu Gln Gly Pro Ile Trp Ala Lys Ile Pro His Thr Asp Gly Asn Phe
    610                 615                 620

His Pro Ser Pro Leu Met Gly Gly Phe Gly Leu Lys His Pro Pro Pro
625                 630                 635                 640

Gln Ile Leu Ile Lys Asn Thr Pro Val Pro Ala Asp Pro Pro Thr Thr
                645                 650                 655

Phe Asn Gln Ser Lys Leu Asn Ser Phe Ile Thr Gln Tyr Ser Thr Gly
            660                 665                 670

Gln Val Ser Val Glu Ile Glu Trp Glu Gln Lys Glu Asn Ser Lys Arg
        675                 680                 685

Trp Asn Pro Glu Ile Gln Tyr Thr Ser Asn Tyr Tyr Lys Ser Thr Ser
    690                 695                 700

Val Asp Phe Ala Val Asn Thr Glu Gly Val Tyr Ser Glu Pro Arg Pro
705                 710                 715                 720

Ile Gly Thr Arg Tyr Leu Thr Arg Asn Leu
                725                 730
```

<210> 9
<211> 728
<212> PRT
<213> Adeno-associated virus serotype 9

<400> 9

```
Ala Ala Asp Gly Tyr Leu Pro Asp Trp Leu Glu Asp Asn Leu Ser Glu
1               5                   10                  15

Gly Ile Arg Glu Trp Trp Ala Leu Lys Pro Gly Ala Pro Gln Pro Lys
            20                  25                  30

Ala Asn Gln Gln His Gln Asp Asn Ala Arg Gly Leu Val Leu Pro Gly
        35                  40                  45

Tyr Lys Tyr Leu Gly Pro Gly Asn Gly Leu Asp Lys Gly Glu Pro Val
    50                  55                  60

Asn Ala Ala Asp Ala Ala Ala Leu Glu His Asp Lys Ala Tyr Asp Gln
65                  70                  75                  80

Gln Leu Lys Ala Gly Asp Asn Pro Tyr Leu Lys Tyr Asn His Ala Asp
                85                  90                  95

Ala Glu Phe Glu Arg Leu Lys Glu Asp Thr Ser Phe Gly Gly Asn Leu
```

```
            100                 105                 110

Gly Arg Ala Val Phe Gln Ala Lys Lys Arg Leu Leu Glu Pro Leu Gly
        115                 120                 125

Leu Val Glu Glu Ala Ala Lys Thr Ala Pro Gly Lys Lys Arg Pro Val
    130                 135                 140

Glu Gln Ser Pro Gln Glu Pro Asp Ser Ser Ala Gly Ile Gly Lys Ser
145                 150                 155                 160

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

Thr Glu Ser Val Pro Asp Pro Gln Pro Ile Gly Glu Pro Pro Ala Ala
            180                 185                 190

Pro Ser Gly Val Gly Leu Thr Met Ala Ser Gly Gly Gly Ala Pro Val
        195                 200                 205

Ala Asp Asn Asn Glu Gly Ala Asp Gly Val Gly Ser Ser Ser Gly Asn
    210                 215                 220

Trp His Cys Asp Ser Gln Trp Leu Gly Asp Arg Val Ile Thr Thr Ser
225                 230                 235                 240

Thr Arg Thr Trp Ala Leu Pro Thr Tyr Asn Asn His Leu Tyr Lys Gln
                245                 250                 255

Ile Ser Asn Ser Thr Ser Gly Gly Ser Ser Asn Asp Asn Ala Tyr Phe
            260                 265                 270

Gly Tyr Ser Thr Pro Trp Gly Tyr Phe Asp Phe Asn Arg Phe His Cys
        275                 280                 285

His Phe Ser Pro Arg Asp Trp Gln Leu Ile Asn Asn Asn Trp Gly Phe
    290                 295                 300

Arg Pro Lys Arg Leu Asn Phe Lys Leu Phe Asn Ile Gln Val Lys Glu
305                 310                 315                 320

Val Thr Asp Asn Asn Gly Val Lys Thr Ile Ala Asn Asn Leu Thr Ser
                325                 330                 335

Thr Val Gln Val Phe Thr Asp Ser Asp Tyr Gln Leu Pro Tyr Val Leu
            340                 345                 350

Gly Ser Ala His Glu Gly Cys Leu Pro Pro Phe Pro Ala Asp Val Phe
        355                 360                 365

Met Ile Pro Gln Tyr Gly Tyr Leu Thr Leu Asn Asp Gly Ser Gln Ala
    370                 375                 380
```

```
Val Gly Arg Ser Ser Phe Tyr Cys Glu Tyr Phe Pro Ser Gln Met Leu
385                 390                 395                 400

Arg Thr Gly Asn Asn Phe Gln Phe Ser Tyr Glu Phe Glu Asn Val Pro
                405                 410                 415

Phe His Ser Ser Tyr Ala His Ser Gln Ser Leu Asp Arg Leu Met Asn
            420                 425                 430

Pro Leu Ile Asp Gln Tyr Leu Tyr Tyr Leu Ser Lys Thr Ile Asn Gly
        435                 440                 445

Ser Gly Gln Asn Gln Gln Thr Leu Lys Phe Ser Val Ala Gly Pro Ser
    450                 455                 460

Asn Met Ala Val Gln Gly Arg Asn Tyr Ile Pro Gly Pro Ser Tyr Arg
465                 470                 475                 480

Gln Gln Arg Val Ser Thr Thr Val Thr Asn Asn Asn Ser Glu Phe Ala
                485                 490                 495

Trp Pro Gly Ala Ser Ser Trp Ala Leu Asn Gly Arg Asn Ser Leu Met
            500                 505                 510

Asn Pro Gly Pro Ala Met Ala Ser His Lys Glu Gly Glu Asp Arg Phe
        515                 520                 525

Phe Pro Leu Ser Gly Ser Leu Ile Phe Gly Lys Gln Gly Thr Gly Arg
    530                 535                 540

Asp Asn Val Asp Ala Asp Lys Val Met Ile Thr Asn Glu Glu Glu Ile
545                 550                 555                 560

Lys Thr Thr Asn Pro Val Ala Thr Glu Ser Tyr Gly Gln Val Ala Thr
                565                 570                 575

Asn His Gln Ser Gln Ala Gln Ala Gln Thr Gly Trp Val Gln Asn Gln
            580                 585                 590

Gly Ile Leu Pro Gly Met Val Trp Gln Asp Arg Asp Val Tyr Leu Gln
        595                 600                 605

Gly Pro Ile Trp Ala Lys Ile Pro His Thr Asp Gly Asn Phe His Pro
    610                 615                 620

Ser Pro Leu Met Gly Gly Phe Gly Met Lys His Pro Pro Pro Gln Ile
625                 630                 635                 640

Leu Ile Lys Asn Thr Pro Val Pro Ala Asp Pro Pro Thr Ala Phe Asn
                645                 650                 655
```

```
Lys Asp Lys Leu Asn Ser Phe Ile Thr Gln Tyr Ser Thr Gly Gln Val
            660                 665                 670

Ser Val Glu Ile Glu Trp Glu Gln Lys Glu Asn Ser Lys Arg Trp Asn
        675                 680                 685

Pro Glu Ile Gln Tyr Thr Ser Asn Tyr Tyr Lys Ser Asn Asn Val Glu
    690                 695                 700

Phe Ala Val Asn Thr Glu Gly Val Tyr Ser Glu Pro Arg Pro Ile Gly
705                 710                 715                 720

Thr Arg Tyr Leu Thr Arg Asn Leu
                725
```

<210> 10
<211> 738
<212> PRT
<213> Adeno-associated virus serotype 10

<400> 10

```
Met Ala Ala Asp Gly Tyr Leu Pro Asp Trp Leu Glu Asp Asn Leu Ser
1               5                   10                  15

Glu Gly Ile Arg Glu Trp Trp Asp Leu Lys Pro Gly Ala Pro Lys Pro
            20                  25                  30

Lys Ala Asn Gln Gln Lys Gln Asp Asp Gly Arg Gly Leu Val Leu Pro
        35                  40                  45

Gly Tyr Lys Tyr Leu Gly Pro Phe Asn Gly Leu Asp Lys Gly Glu Pro
    50                  55                  60

Val Asn Ala Ala Asp Ala Ala Ala Leu Glu His Asp Lys Ala Tyr Asp
65                  70                  75                  80

Gln Gln Leu Lys Ala Gly Asp Asn Pro Tyr Leu Arg Tyr Asn His Ala
                85                  90                  95

Asp Ala Glu Phe Gln Glu Arg Leu Gln Glu Asp Thr Ser Phe Gly Gly
            100                 105                 110

Asn Leu Gly Arg Ala Val Phe Gln Ala Lys Lys Arg Val Leu Glu Pro
        115                 120                 125

Leu Gly Leu Val Glu Glu Gly Ala Lys Thr Ala Pro Gly Lys Lys Arg
    130                 135                 140

Pro Val Glu Pro Ser Pro Gln Arg Ser Pro Asp Ser Ser Thr Gly Ile
145                 150                 155                 160

Gly Lys Lys Gly Gln Gln Pro Ala Lys Lys Arg Leu Asn Phe Gly Gln
```

```
                165                 170                 175

Thr Gly Asp Ser Glu Ser Val Pro Asp Pro Gln Pro Ile Gly Glu Pro
            180                 185                 190

Pro Ala Gly Pro Ser Gly Leu Gly Ser Gly Thr Met Ala Ala Gly Gly
        195                 200                 205

Gly Ala Pro Met Ala Asp Asn Asn Glu Gly Ala Asp Gly Val Gly Ser
    210                 215                 220

Ser Ser Gly Asn Trp His Cys Asp Ser Thr Trp Leu Gly Asp Arg Val
225                 230                 235                 240

Ile Thr Thr Ser Thr Arg Thr Trp Ala Leu Pro Thr Tyr Asn Asn His
                245                 250                 255

Leu Tyr Lys Gln Ile Ser Asn Gly Thr Ser Gly Gly Ser Thr Asn Asp
            260                 265                 270

Asn Thr Tyr Phe Gly Tyr Ser Thr Pro Trp Gly Tyr Phe Asp Phe Asn
        275                 280                 285

Arg Phe His Cys His Phe Ser Pro Arg Asp Trp Gln Arg Leu Ile Asn
    290                 295                 300

Asn Asn Trp Gly Phe Arg Pro Lys Arg Leu Asn Phe Lys Leu Phe Asn
305                 310                 315                 320

Ile Gln Val Lys Glu Val Thr Gln Asn Glu Gly Thr Lys Thr Ile Ala
                325                 330                 335

Asn Asn Leu Thr Ser Thr Ile Gln Val Phe Thr Asp Ser Glu Tyr Gln
            340                 345                 350

Leu Pro Tyr Val Leu Gly Ser Ala His Gln Gly Cys Leu Pro Pro Phe
        355                 360                 365

Pro Ala Asp Val Phe Met Ile Pro Gln Tyr Gly Tyr Leu Thr Leu Asn
    370                 375                 380

Asn Gly Ser Gln Ala Val Gly Arg Ser Ser Phe Tyr Cys Leu Glu Tyr
385                 390                 395                 400

Phe Pro Ser Gln Met Leu Arg Thr Gly Asn Asn Phe Glu Phe Ser Tyr
                405                 410                 415

Gln Phe Glu Asp Val Pro Phe His Ser Ser Tyr Ala His Ser Gln Ser
            420                 425                 430

Leu Asp Arg Leu Met Asn Pro Leu Ile Asp Gln Tyr Leu Tyr Tyr Leu
        435                 440                 445
```

```
Ser Arg Thr Gln Ser Thr Gly Gly Thr Ala Gly Thr Gln Gln Leu Leu
    450                 455                 460

Phe Ser Gln Ala Gly Pro Asn Asn Met Ser Ala Gln Ala Lys Asn Trp
465                 470                 475                 480

Leu Pro Gly Pro Cys Tyr Arg Gln Gln Arg Val Ser Thr Thr Leu Ser
                485                 490                 495

Gln Asn Asn Asn Ser Asn Phe Ala Trp Thr Gly Ala Thr Lys Tyr His
            500                 505                 510

Leu Asn Gly Arg Asp Ser Leu Val Asn Pro Gly Val Ala Met Ala Thr
        515                 520                 525

His Lys Asp Asp Glu Glu Arg Phe Phe Pro Ser Ser Gly Val Leu Met
    530                 535                 540

Phe Gly Lys Gln Gly Ala Gly Lys Asp Asn Val Asp Tyr Ser Ser Val
545                 550                 555                 560

Met Leu Thr Ser Glu Glu Glu Ile Lys Thr Thr Asn Pro Val Ala Thr
                565                 570                 575

Glu Gln Tyr Gly Val Val Ala Asp Asn Leu Gln Gln Gln Asn Ala Ala
            580                 585                 590

Pro Ile Val Gly Ala Val Asn Ser Gln Gly Ala Leu Pro Gly Met Val
        595                 600                 605

Trp Gln Asn Arg Asp Val Tyr Leu Gln Gly Pro Ile Trp Ala Lys Ile
    610                 615                 620

Pro His Thr Asp Gly Asn Phe His Pro Ser Pro Leu Met Gly Gly Phe
625                 630                 635                 640

Gly Leu Lys His Pro Pro Pro Gln Ile Leu Ile Lys Asn Thr Pro Val
                645                 650                 655

Pro Ala Asp Pro Pro Thr Thr Phe Ser Gln Ala Lys Leu Ala Ser Phe
            660                 665                 670

Ile Thr Gln Tyr Ser Thr Gly Gln Val Ser Val Glu Ile Glu Trp Glu
        675                 680                 685

Leu Gln Lys Glu Asn Ser Lys Arg Trp Asn Pro Glu Ile Gln Tyr Thr
    690                 695                 700

Ser Asn Tyr Tyr Lys Ser Thr Asn Val Asp Phe Ala Val Asn Thr Asp
705                 710                 715                 720
```

Gly Thr Tyr Ser Glu Pro Arg Pro Ile Gly Thr Arg Tyr Leu Thr Arg
725 730 735

Asn Leu

<210> 11
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> Forward Oligonucleotide Primer

<400> 11
accagaacct gggctctgcc cactttcaac aaccatctct acaag 45

<210> 12
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> Reverse Oligonucleotide Primer

<400> 12
caatcaggag cttcgaacga caaccacttc tttggctaca gcacc 45

<210> 13
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 13
cttatcgatc agtatctgta cttcctgaac agaacgcaag gaaca 45

<210> 14
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 14
gctaacgaca acaacaacag taactatcca tggacagcgg ccagcaaa 48

<210> 15
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 15
tggaatccag agattcagtt cacgtccaac tacaacaagt ctgtt 45

<210> 16
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 16
gagattcagt acacgtccaa cttcaacaag tctgttaatg tggac 45

<210> 17
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 17
gtgaacctcg ccctattgga acccggtttc tcacacgaaa cttg 44

<210> 18
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 18
tcccatagta acgccaatag g 21

<210> 19
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 19
cttggcatat gatacacttg atg 23

<210> 20
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 20
tcccatagta acgccaatag g 21

<210> 21
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 21

cttggcatat gatacacttg atg 23

<210> 22
<211> 145
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic Sequence

<400> 22
aggaacccct agtgatggag ttggccactc cctctctgcg cgctcgctcg ctcactgagg 60

ccgggcgacc aaaggtcgcc cgacgcccgg gctttgcccg ggcggcctca gtgagcgagc 120

gagcgcgcag agagggagtg gccaa 145

<210> 23
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 23
ctccatcact aggggttcct 20

<210> 24
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 24
ctccatcact aggggttcct 20

<210> 25
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide Primer

<400> 25
gaggtagtga tccccaagga 20

<210> 26
<211> 870
<212> DNA
<213> Trichosanthes kirilowii

<400> 26
atgatcagat tcttagtcct ctctttgcta attctcaccc tcttcctaac aactcctgct 60

gtggagggcg atgttagctt ccgtttatca ggtgcaacaa gcagttccta tggagttttc 120

atttcaaatc tgagaaaagc tcttccaaat gaaaggaaac tgtacgatat ccctctgtta 180

cgttcctctc ttccaggttc tcaacgctac gcattgatcc atctcacaaa ttacgccgat 240

gaaaccattt cagtggccat agacgtaacg aacgtctata ttatgggata tcgcgctggc 300

gatacatcct attttttcaa cgaggcttct gcaacagaag ctgcaaaata tgtattcaaa 360

gacgctatgc gaaaagttac gcttccatat tctggcaatt acgaaaggct tcaaactgct 420

gcaggcaaaa taagggaaaa tattccgctt ggactccctg ctttggacag tgccattacc 480

actttgtttt actacaacgc caattctgct gcgtcggcac ttatggtact cattcagtcg 540

acgtctgagg ctgcgaggta taaatttatt gagcaacaaa ttgggaagcg tgttgacaaa 600

accttcctac caagtttagc aattataagt ttggaaaata gttggtctgc tctctccaag 660

caaattcaga tagcgagtac taataatgga cagtttgaaa gtcctgttgt gcttataaat 720

gctcaaaacc aacgagtcac gataaccaat gttgatgctg gagttgtaac ctccaacatc 780

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