SEQUENCE LISTING

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Mück-Häusl, Martin

<120> Means and methods for treating HBV

<130> HEL15387PCT

<150> LU 92942
<151> 2016-01-12

<160> 27

<170> PatentIn version 3.5

<210> 1
<211> 400
<212> PRT
<213> Artificial Sequence

<220>
<223> HBV genotype C large envelope protein consensus sequence

<400> 1

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Met Gly Gly Trp Ser Ser Lys Pro Arg Gln Gly Met Gly Thr Asn Leu
1               5                  10                  15


Ser Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro
            20                  25                  30


Ala Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Asn
        35                  40                  45


Lys Asp His Trp Pro Glu Ala Asn Gln Val Gly Ala Gly Ala Phe Gly
    50                  55                  60


Pro Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln
65                  70                  75                  80


Ala Gln Gly Ile Leu Thr Thr Val Pro Ala Ala Pro Pro Pro Ala Ser
                85                  90                  95


Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu
```

```
            100                 105                 110

Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His
        115                 120                 125

Gln Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly
    130                 135                 140

Gly Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro
145                 150                 155                 160

Ile Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Pro Asn Met Glu
                165                 170                 175

Asn Thr Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly
            180                 185                 190

Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser
        195                 200                 205

Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Ala Pro Thr Cys Pro Gly
    210                 215                 220

Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro
225                 230                 235                 240

Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile
                245                 250                 255

Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu
            260                 265                 270

Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser
        275                 280                 285

Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly
    290                 295                 300

Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn
305                 310                 315                 320
```

```
Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu
                325                 330                 335


Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro
            340                 345                 350


Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val
        355                 360                 365


Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Asn Ile Leu Ser
    370                 375                 380


Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile
385                 390                 395                 400
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<210> 2
<211> 183
<212> PRT
<213> Artificial Sequence

<220>
<223> HBV genotype C core protein consensus sequence

<400> 2

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


Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Ile Arg Asp Leu Leu Asp
            20                  25                  30


Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
        35                  40                  45


Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
    50                  55                  60


Leu Met Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala
65                  70                  75                  80


Ser Arg Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys
                85                  90                  95
```

```
Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
            100                 105                 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
        115                 120                 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
    130                 135                 140

Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr
145                 150                 155                 160

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser
                165                 170                 175

Gln Ser Arg Glu Ser Gln Cys
            180
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<210> 3
<211> 343
<212> PRT
<213> Artificial Sequence

<220>
<223> HBV RT domain of polymerase consensus sequence

<400> 3

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Glu Asp Trp Gly Pro Cys Thr Glu His Gly Glu His His Ile Arg Ile
1               5                   10                  15

Pro Arg Thr Pro Ala Arg Val Thr Gly Gly Val Phe Leu Val Asp Lys
            20                  25                  30

Asn Pro His Asn Thr Ala Glu Ser Arg Leu Val Val Asp Phe Ser Gln
        35                  40                  45

Phe Ser Arg Gly Asn Thr Arg Val Ser Trp Pro Lys Phe Ala Val Pro
    50                  55                  60

Asn Leu Gln Ser Leu Thr Asn Leu Leu Ser Ser Asn Leu Ser Trp Leu
65                  70                  75                  80
```

```
Ser Leu Asp Val Ser Ala Ala Phe Tyr His Leu Pro Leu His Pro Ala
                85                  90                  95

Ala Met Pro His Leu Leu Val Gly Ser Ser Gly Leu Ser Arg Tyr Val
            100                 105                 110

Ala Arg Leu Ser Ser Asn Ser Arg Ile Ile Asn His Gln His Gly Thr
        115                 120                 125

Met Gln Asn Leu His Asp Ser Cys Ser Arg Asn Leu Tyr Val Ser Leu
    130                 135                 140

Leu Leu Leu Tyr Lys Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His
145                 150                 155                 160

Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly Val Gly Leu Ser
                165                 170                 175

Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser Val Val Arg
            180                 185                 190

Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp Asp Val Val
        195                 200                 205

Leu Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu Tyr Thr Ala Val
    210                 215                 220

Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro Asn Lys Thr
225                 230                 235                 240

Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met Gly Tyr Val Ile Gly Ser
                245                 250                 255

Trp Gly Thr Leu Pro Gln Glu His Ile Val Gln Lys Ile Lys Gln Cys
            260                 265                 270

Phe Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys Val Cys Gln
        275                 280                 285

Arg Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly
```

```
    290                 295                 300

Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ala Lys Gln Ala
305                 310                 315                 320

Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys Lys Gln Tyr Leu
                325                 330                 335

Asn Leu Tyr Pro Val Ala Arg
            340
```

<210> 4
<211> 400
<212> PRT
<213> Artificial Sequence

<220>
<223> HBV large envelope protein

<400> 4

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Met Gly Gly Trp Ser Ser Lys Pro Arg Gln Gly Met Gly Thr Asn Leu
1               5                   10                  15

Ser Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro
            20                  25                  30

Ala Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Asn
        35                  40                  45

Lys Asp His Trp Pro Glu Ala Asn Gln Val Gly Ala Gly Ala Phe Gly
    50                  55                  60

Pro Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln
65                  70                  75                  80

Ala Gln Gly Ile Leu Thr Thr Val Pro Ala Ala Pro Pro Pro Ala Ser
                85                  90                  95

Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu
            100                 105                 110

Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His
```

```
        115                 120                 125

Gln Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly
    130                 135                 140

Gly Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro
145                 150                 155                 160

Ile Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Pro Asn Met Glu
                165                 170                 175

Asn Thr Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly
            180                 185                 190

Phe Leu Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser
        195                 200                 205

Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Ala Pro Thr Cys Pro Gly
    210                 215                 220

Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro
225                 230                 235                 240

Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile
                245                 250                 255

Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu
            260                 265                 270

Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser
        275                 280                 285

Thr Thr Ser Thr Gly Pro Cys Arg Thr Cys Thr Ile Pro Ala Gln Gly
    290                 295                 300

Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn
305                 310                 315                 320

Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Lys Phe Leu
                325                 330                 335
```

Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro
340 345 350

Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Val
355 360 365

Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Asn Ile Leu Ser
370 375 380

Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile
385 390 395 400

<210> 5
<211> 183
<212> PRT
<213> Artificial Sequence

<220>
<223> HBV core protein

<400> 5

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

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Ile Arg Asp Leu Leu Asp
20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
35 40 45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
50 55 60

Leu Met Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala
65 70 75 80

Ser Arg Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys
85 90 95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
100 105 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
        115   120   125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
    130   135   140

Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr
145   150   155   160

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser
                165   170   175

Gln Ser Arg Glu Ser Gln Cys
            180

<210> 6
<211> 344
<212> PRT
<213> Artificial Sequence

<220>
<223> HBV RT domain of polymerase

<400> 6

Glu Asp Trp Gly Pro Cys Ala Glu His Gly Glu His His Ile Arg Ile
1   5   10   15

Pro Arg Thr Pro Ala Arg Val Thr Gly Gly Val Phe Leu Val Asp Lys
            20   25   30

Asn Pro His Asn Thr Ala Glu Ser Arg Leu Val Val Asp Phe Ser Gln
        35   40   45

Phe Ser Arg Gly Lys Thr Arg Val Ser Trp Pro Lys Phe Ala Val Pro
    50   55   60

Asn Leu Gln Ser Leu Thr Asn Leu Leu Ser Ser Asn Leu Ser Trp Leu
65   70   75   80

Ser Leu Asp Val Ser Ala Ala Phe Tyr His Ile Pro Leu His Pro Ala
                85   90   95

```
Ala Met Pro His Leu Leu Val Gly Ser Ser Gly Leu Ser Arg Tyr Val
            100                 105                 110

Ala Arg Leu Ser Ser Asn Ser Arg Ile Phe Asn His Gln His Gly Asn
        115                 120                 125

Leu Gln Asn Leu His Asp Ser Cys Ser Arg Asn Leu Tyr Val Ser Leu
    130                 135                 140

Leu Leu Leu Tyr Lys Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His
145                 150                 155                 160

Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly Val Gly Leu Ser
                165                 170                 175

Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser Val Val Arg
            180                 185                 190

Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp Asp Val Val
        195                 200                 205

Leu Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu Phe Thr Ala Val
    210                 215                 220

Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro Asn Lys Thr
225                 230                 235                 240

Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met Gly Tyr Val Ile Gly Ser
                245                 250                 255

Trp Gly Thr Leu Pro Gln Glu His Ile Val Gln Lys Ile Lys Gln Cys
            260                 265                 270

Phe Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys Val Cys Gln
        275                 280                 285

Arg Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly
    290                 295                 300

Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ser Lys Gln Ala
```

305 310 315 320

Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys Lys Gln Tyr Leu
325 330 335

Asn Leu Tyr Pro Val Ala Arg Gln
340

<210> 7
<211> 1388
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion polypeptide

<400> 7

Met Glu Asn Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln
1 5 10 15

Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu
20 25 30

Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Ser Pro Val Cys
35 40 45

Leu Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser
50 55 60

Cys Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe
65 70 75 80

Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val
85 90 95

Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly
100 105 110

Ser Thr Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Thr Pro Ala
115 120 125

Gln Gly Asn Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Thr Asp

```
    130                 135                 140

Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Lys
145                 150                 155                 160

Tyr Leu Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu
                165                 170                 175

Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu
            180                 185                 190

Ser Ala Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile
        195                 200                 205

Val Ser Pro Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val
    210                 215                 220

Tyr Ile Gly Ser Gly Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly
225                 230                 235                 240

Asp Val Glu Glu Asn Pro Gly Pro Met Asp Ile Asp Pro Tyr Lys Glu
                245                 250                 255

Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe
            260                 265                 270

Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu
        275                 280                 285

Ala Leu Glu Ser Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg
    290                 295                 300

Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Thr Leu Ala Thr Trp Val
305                 310                 315                 320

Gly Val Asn Leu Glu Asp Pro Ala Ser Arg Asp Leu Val Val Ser Tyr
                325                 330                 335

Val Asn Thr Asn Met Gly Leu Lys Phe Arg Gln Leu Leu Trp Phe His
            340                 345                 350
```

```
Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val Ile Glu Tyr Leu Val
        355                 360                 365

Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn
    370                 375                 380

Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr Val Val Gly Ser Gly
385                 390                 395                 400

Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp Val Glu Glu Asn
                405                 410                 415

Pro Gly Pro Glu Asp Trp Gly Pro Cys Ala Glu His Gly Glu His His
            420                 425                 430

Ile Arg Ile Pro Arg Thr Pro Ala Arg Val Thr Gly Gly Val Phe Leu
        435                 440                 445

Val Asp Lys Asn Pro His Asn Thr Ala Glu Ser Arg Leu Val Val Asp
    450                 455                 460

Phe Ser Gln Phe Ser Arg Gly Lys Thr Arg Val Ser Trp Pro Lys Phe
465                 470                 475                 480

Ala Val Pro Asn Leu Gln Ser Leu Thr Asn Leu Leu Ser Ser Asn Leu
                485                 490                 495

Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr His Ile Pro Leu
            500                 505                 510

His Pro Ala Ala Met Pro His Leu Leu Val Gly Ser Ser Gly Leu Ser
        515                 520                 525

Arg Tyr Val Ala Arg Leu Ser Ser Asn Ser Arg Ile Phe Asn His Gln
    530                 535                 540

His Gly Asn Leu Gln Asn Leu His Asp Ser Cys Ser Arg Asn Leu Tyr
545                 550                 555                 560

Val Ser Leu Leu Leu Leu Tyr Lys Thr Phe Gly Arg Lys Leu His Leu
```

```
               565                 570                 575

Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly Val
            580                 585                 590

Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser
        595                 600                 605

Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp
    610                 615                 620

Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu Phe
625                 630                 635                 640

Thr Ala Val Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro
                645                 650                 655

Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met Gly Tyr Val
            660                 665                 670

Ile Gly Ser Trp Gly Thr Leu Pro Gln Glu His Ile Val Gln Lys Ile
        675                 680                 685

Lys Gln Cys Phe Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys
    690                 695                 700

Val Cys Gln Arg Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr
705                 710                 715                 720

Gln Cys Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ser
                725                 730                 735

Lys Gln Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys Lys
            740                 745                 750

Gln Tyr Leu Asn Leu Tyr Pro Val Ala Arg Gln Gly Ser Gly Glu Gly
        755                 760                 765

Arg Gly Ser Leu Leu Thr Cys Gly Asp Val Glu Glu Asn Pro Gly Pro
    770                 775                 780
```

```
Met Gly Gly Trp Ser Ser Lys Pro Arg Gln Gly Met Gly Thr Asn Leu
785                 790                 795                 800


Ser Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro
                805                 810                 815


Ala Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Asn
            820                 825                 830


Lys Asp His Trp Pro Glu Ala Asn Gln Val Gly Ala Gly Ala Phe Gly
        835                 840                 845


Pro Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln
    850                 855                 860


Ala Gln Gly Ile Leu Thr Thr Val Pro Ala Ala Pro Pro Pro Ala Ser
865                 870                 875                 880


Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu
                885                 890                 895


Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His
            900                 905                 910


Gln Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly
        915                 920                 925


Gly Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro
    930                 935                 940


Ile Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Pro Asn Met Glu
945                 950                 955                 960


Asn Thr Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly
                965                 970                 975


Phe Leu Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser
            980                 985                 990


Trp Trp Thr Ser Leu Asn Phe Leu  Gly Gly Ala Pro Thr  Cys Pro Gly
```

```
        995                 1000                1005

Gln Asn  Ser Gln Ser Pro Thr  Ser Asn His Ser Pro  Thr Ser Cys
    1010                1015                1020

Pro Pro  Ile Cys Pro Gly Tyr  Arg Trp Met Cys Leu  Arg Arg Phe
    1025                1030                1035

Ile Ile  Phe Leu Phe Ile Leu  Leu Leu Cys Leu Ile  Phe Leu Leu
    1040                1045                1050

Val Leu  Leu Asp Tyr Gln Gly  Met Leu Pro Val Cys  Pro Leu Leu
    1055                1060                1065

Pro Gly  Thr Ser Thr Thr Ser  Thr Gly Pro Cys Arg  Thr Cys Thr
    1070                1075                1080

Ile Pro  Ala Gln Gly Thr Ser  Met Phe Pro Ser Cys  Cys Cys Thr
    1085                1090                1095

Lys Pro  Ser Asp Gly Asn Cys  Thr Cys Ile Pro Ile  Pro Ser Ser
    1100                1105                1110

Trp Ala  Phe Ala Lys Phe Leu  Trp Glu Trp Ala Ser  Val Arg Phe
    1115                1120                1125

Ser Trp  Leu Ser Leu Leu Val  Pro Phe Val Gln Trp  Phe Val Gly
    1130                1135                1140

Leu Ser  Pro Thr Val Trp Leu  Ser Val Ile Trp Met  Met Trp Tyr
    1145                1150                1155

Trp Gly  Pro Ser Leu Tyr Asn  Ile Leu Ser Pro Phe  Leu Pro Leu
    1160                1165                1170

Leu Pro  Ile Phe Phe Cys Leu  Trp Val Tyr Ile Gly  Ser Gly Glu
    1175                1180                1185

Gly Arg  Gly Ser Leu Leu Thr  Cys Gly Asp Val Glu  Glu Asn Pro
    1190                1195                1200
```

```
Gly Pro  Met Asp Ile Asp Pro  Tyr Lys Glu Phe Gly  Ala Ser Val
    1205                 1210                 1215

Glu Leu  Leu Ser Phe Leu Pro  Ser Asp Phe Phe Pro  Ser Ile Arg
    1220                 1225                 1230

Asp Leu  Leu Asp Thr Ala Ser  Ala Leu Tyr Arg Glu  Ala Leu Glu
    1235                 1240                 1245

Ser Pro  Glu His Cys Ser Pro  His His Thr Ala Leu  Arg Gln Ala
    1250                 1255                 1260

Ile Leu  Cys Trp Gly Glu Leu  Met Asn Leu Ala Thr  Trp Val Gly
    1265                 1270                 1275

Ser Asn  Leu Glu Asp Pro Ala  Ser Arg Glu Leu Val  Val Ser Tyr
    1280                 1285                 1290

Val Asn  Val Asn Met Gly Leu  Lys Ile Arg Gln Leu  Leu Trp Phe
    1295                 1300                 1305

His Ile  Ser Cys Leu Thr Phe  Gly Arg Glu Thr Val  Leu Glu Tyr
    1310                 1315                 1320

Leu Val  Ser Phe Gly Val Trp  Ile Arg Thr Pro Pro  Ala Tyr Arg
    1325                 1330                 1335

Pro Pro  Asn Ala Pro Ile Leu  Ser Thr Leu Pro Glu  Thr Thr Val
    1340                 1345                 1350

Val Arg  Arg Arg Gly Arg Ser  Pro Arg Arg Arg Thr  Pro Ser Pro
    1355                 1360                 1365

Arg Arg  Arg Arg Ser Gln Ser  Pro Arg Arg Arg Arg  Ser Gln Ser
    1370                 1375                 1380

Arg Glu  Ser Gln Cys
    1385
```

<210> 8

<211> 226
<212> PRT
<213> Artificial Sequence

<220>
<223> HBV small envelope protein

<400> 8

Met Glu Asn Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln
1 5 10 15

Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu
20 25 30

Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Ser Pro Val Cys
35 40 45

Leu Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser
50 55 60

Cys Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe
65 70 75 80

Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val
85 90 95

Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly
100 105 110

Ser Thr Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Thr Pro Ala
115 120 125

Gln Gly Asn Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Thr Asp
130 135 140

Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Lys
145 150 155 160

Tyr Leu Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu
165 170 175

Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu

```
            180                 185                 190

Ser Ala Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile
        195                 200                 205

Val Ser Pro Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val
    210                 215                 220

Tyr Ile
225
```

<210> 9
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> P2A cleavage fragment

<400> 9

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Gly Ser Gly Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp Val
1               5                   10                  15

Glu Glu Asn Pro Gly
            20
```

<210> 10
<211> 247
<212> PRT
<213> Artificial sequence

<220>
<223> HBV small envelope protein

<400> 10

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Met Glu Asn Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln
1               5                   10                  15

Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu
            20                  25                  30

Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Ser Pro Val Cys
        35                  40                  45
```

```
Leu Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser
    50                  55                  60

Cys Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe
65                  70                  75                  80

Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val
                85                  90                  95

Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly
            100                 105                 110

Ser Thr Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Thr Pro Ala
        115                 120                 125

Gln Gly Asn Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Thr Asp
    130                 135                 140

Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Lys
145                 150                 155                 160

Tyr Leu Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu
                165                 170                 175

Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu
            180                 185                 190

Ser Ala Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile
        195                 200                 205

Val Ser Pro Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val
    210                 215                 220

Tyr Ile Gly Ser Gly Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly
225                 230                 235                 240

Asp Val Glu Glu Asn Pro Gly
                245
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<210> 11

<211> 149
<212> PRT
<213> Artificial Sequence

<220>
<223> HBV core protein amino acids 1-149

<400> 11

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

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
35 40 45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
50 55 60

Leu Met Thr Leu Ala Thr Trp Val Gly Val Asn Leu Glu Asp Pro Ala
65 70 75 80

Ser Arg Asp Leu Val Val Ser Tyr Val Asn Thr Asn Met Gly Leu Lys
85 90 95

Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
100 105 110

Glu Thr Val Ile Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
115 120 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
130 135 140

Glu Thr Thr Val Val
145

<210> 12
<211> 171
<212> PRT
<213> Artificial Sequence

<220>
<223> HBV core protein amino acids 1-149

<400> 12

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


Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu
            20                  25                  30


Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His
        35                  40                  45


Cys Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly
    50                  55                  60


Glu Leu Met Thr Leu Ala Thr Trp Val Gly Val Asn Leu Glu Asp Pro
65                  70                  75                  80


Ala Ser Arg Asp Leu Val Val Ser Tyr Val Asn Thr Asn Met Gly Leu
                85                  90                  95


Lys Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly
            100                 105                 110


Arg Glu Thr Val Ile Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg
        115                 120                 125


Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu
    130                 135                 140


Pro Glu Thr Thr Val Val Gly Ser Gly Ala Thr Asn Phe Ser Leu Leu
145                 150                 155                 160


Lys Gln Ala Gly Asp Val Glu Glu Asn Pro Gly
                165                 170
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<210> 13
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> T2A cleavage fragment

<400> 13

Gly Ser Gly Glu Gly Arg Gly Ser Leu Leu Thr Cys Gly Asp Val Glu
1   5   10   15

Glu Asn Pro Gly
            20

<210> 14
<211> 421
<212> PRT
<213> Artificial Sequence

<220>
<223> HBV large envelope protein

<400> 14

Pro Met Gly Gly Trp Ser Ser Lys Pro Arg Gln Gly Met Gly Thr Asn
1   5   10   15

Leu Ser Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp
            20   25   30

Pro Ala Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro
        35   40   45

Asn Lys Asp His Trp Pro Glu Ala Asn Gln Val Gly Ala Gly Ala Phe
    50   55   60

Gly Pro Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro
65   70   75   80

Gln Ala Gln Gly Ile Leu Thr Thr Val Pro Ala Ala Pro Pro Pro Ala
                85   90   95

Ser Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro
            100   105   110

Leu Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe
        115   120   125

```
His Gln Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala
    130                 135                 140

Gly Gly Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser
145                 150                 155                 160

Pro Ile Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Pro Asn Met
                165                 170                 175

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

Gly Phe Leu Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp
        195                 200                 205

Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Ala Pro Thr Cys Pro
    210                 215                 220

Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys
225                 230                 235                 240

Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile
                245                 250                 255

Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu
            260                 265                 270

Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr
        275                 280                 285

Ser Thr Thr Ser Thr Gly Pro Cys Arg Thr Cys Thr Ile Pro Ala Gln
    290                 295                 300

Gly Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly
305                 310                 315                 320

Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Lys Phe
                325                 330                 335

Leu Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val
```

340 345 350

Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser
355 360 365

Val Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Asn Ile Leu
370 375 380

Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr
385 390 395 400

Ile Gly Ser Gly Glu Gly Arg Gly Ser Leu Leu Thr Cys Gly Asp Val
405 410 415

Glu Glu Asn Pro Gly
420

<210> 15
<211> 184
<212> PRT
<213> Artificial Sequence

<220>
<223> HBV core protein

<400> 15

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

Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Ile Arg Asp Leu Leu
20 25 30

Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His
35 40 45

Cys Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly
50 55 60

Glu Leu Met Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro
65 70 75 80

Ala Ser Arg Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu

85 90 95

Lys Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly
100 105 110

Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg
115 120 125

Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu
130 135 140

Pro Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg
145 150 155 160

Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg
165 170 175

Ser Gln Ser Arg Glu Ser Gln Cys
180

<210> 16
<211> 365
<212> PRT
<213> Artificial Sequence

<220>
<223> HBV RT domain of polymerase

<400> 16

Pro Glu Asp Trp Gly Pro Cys Ala Glu His Gly Glu His His Ile Arg
1 5 10 15

Ile Pro Arg Thr Pro Ala Arg Val Thr Gly Gly Val Phe Leu Val Asp
20 25 30

Lys Asn Pro His Asn Thr Ala Glu Ser Arg Leu Val Val Asp Phe Ser
35 40 45

Gln Phe Ser Arg Gly Lys Thr Arg Val Ser Trp Pro Lys Phe Ala Val
50 55 60

Pro Asn Leu Gln Ser Leu Thr Asn Leu Leu Ser Ser Asn Leu Ser Trp

```
65                  70                  75                  80

Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr His Ile Pro Leu His Pro
                85                  90                  95

Ala Ala Met Pro His Leu Leu Val Gly Ser Ser Gly Leu Ser Arg Tyr
            100                 105                 110

Val Ala Arg Leu Ser Ser Asn Ser Arg Ile Phe Asn His Gln His Gly
        115                 120                 125

Asn Leu Gln Asn Leu His Asp Ser Cys Ser Arg Asn Leu Tyr Val Ser
    130                 135                 140

Leu Leu Leu Leu Tyr Lys Thr Phe Gly Arg Lys Leu His Leu Tyr Ser
145                 150                 155                 160

His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly Val Gly Leu
                165                 170                 175

Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser Val Val
            180                 185                 190

Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp Asp Val
        195                 200                 205

Val Leu Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu Phe Thr Ala
    210                 215                 220

Val Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro Asn Lys
225                 230                 235                 240

Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met Gly Tyr Val Ile Gly
                245                 250                 255

Ser Trp Gly Thr Leu Pro Gln Glu His Ile Val Gln Lys Ile Lys Gln
            260                 265                 270

Cys Phe Arg Lys Leu Pro Val Asn Arg Pro Ile Asp Trp Lys Val Cys
        275                 280                 285
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Gln Arg Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys
290 295 300

Gly Tyr Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ser Lys Gln
305 310 315 320

Ala Phe Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys Lys Gln Tyr
325 330 335

Leu Asn Leu Tyr Pro Val Ala Arg Gln Gly Ser Gly Glu Gly Arg Gly
340 345 350

Ser Leu Leu Thr Cys Gly Asp Val Glu Glu Asn Pro Gly
355 360 365

<210> 17
<211> 102
<212> DNA
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<220>
<223> P7.5 promoter

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tttctcgtaa aagtagaaaa tatattctaa tttattgcac gg 102

<210> 18
<211> 138
<212> DNA
<213> Artificial Sequence

<220>
<223> PH5 promoter

<400> 18
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atcaactacc tataaaactt tccctgcagg tcagcttaaa aattgaaatt ttatttttt 120

tttttggaat ataaataa 138

<210> 19
<211> 8
<212> PRT

<213> Artificial Sequence

<220>
<223> S190 peptide

<400> 19

Val Trp Leu Ser Val Ile Trp Met
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<210> 20
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> MVA B8R peptide

<400> 20

Thr Ser Tyr Lys Phe Glu Ser Val
1   5

<210> 21
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> S208 peptide

<400> 21

Ile Leu Ser Pro Phe Leu Pro Leu
1   5

<210> 22
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> S208 adw peptide

<400> 22

Ile Val Ser Pro Phe Ile Pro Leu
1   5

<210> 23

<211> 226
<212> PRT
<213> Artificial Sequence

<220>
<223> S Pool peptide

<400> 23

Met Glu Asn Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln
1 5 10 15

Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu
20 25 30

Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr Thr Val Cys
35 40 45

Leu Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser
50 55 60

Cys Pro Pro Thr Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe
65 70 75 80

Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val
85 90 95

Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly
100 105 110

Ser Ser Thr Thr Ser Thr Gly Pro Cys Arg Thr Cys Met Thr Thr Ala
115 120 125

Gln Gly Thr Ser Met Tyr Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp
130 135 140

Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Gly Lys
145 150 155 160

Phe Leu Trp Glu Trp Ala Ser Ala Arg Phe Ser Trp Leu Ser Leu Leu
165 170 175

Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu

```
            180                 185                 190

Ser Val Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile
        195                 200                 205

Leu Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val
    210                 215                 220

Tyr Ile
225
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<210> 24
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> C93 peptide

<400> 24

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1               5
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<210> 25
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> beta-Gal96 peptide

<400> 25

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1               5
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<210> 26
<211> 193
<212> PRT
<213> Homo sapiens

<400> 26

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Met Pro Glu Glu Gly Ser Gly Cys Ser Val Arg Arg Arg Pro Tyr Gly
1               5                   10                  15
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Cys Val Leu Arg Ala Ala Leu Val Pro Leu Val Ala Gly Leu Val Ile
            20                  25                  30

Cys Leu Val Val Cys Ile Gln Arg Phe Ala Gln Ala Gln Gln Gln Leu
        35                  40                  45

Pro Leu Glu Ser Leu Gly Trp Asp Val Ala Glu Leu Gln Leu Asn His
    50                  55                  60

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

Leu Gly Arg Ser Phe Leu His Gly Pro Glu Leu Asp Lys Gly Gln Leu
                85                  90                  95

Arg Ile His Arg Asp Gly Ile Tyr Met Val His Ile Gln Val Thr Leu
            100                 105                 110

Ala Ile Cys Ser Ser Thr Thr Ala Ser Arg His His Pro Thr Thr Leu
        115                 120                 125

Ala Val Gly Ile Cys Ser Pro Ala Ser Arg Ser Ile Ser Leu Leu Arg
    130                 135                 140

Leu Ser Phe His Gln Gly Cys Thr Ile Ala Ser Gln Arg Leu Thr Pro
145                 150                 155                 160

Leu Ala Arg Gly Asp Thr Leu Cys Thr Asn Leu Thr Gly Thr Leu Leu
                165                 170                 175

Pro Ser Arg Asn Thr Asp Glu Thr Phe Phe Gly Val Gln Trp Val Arg
            180                 185                 190

Pro
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<210> 27
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<213> Artificial Sequence

<220>

<223> vaccination vector

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tcgttcgata ttagtacaga aacatggaat aaattattat ccaattatta tatgaagatg 240

atagagtatg ctaaacttta tgtactaagt cctattctcg ctgaggagtt ggataatttt 300

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