SEQUENCE LISTING

<110> Alnylam Pharmaceuticals, Inc.
Jadhav, Vasant R.
Maier, Martin A.
Milstein, Stuart
Schlegel, Mark K.

<120> HEPATITS B VIRUS (HBV) dsRNA AGENT COMPOSITIONS AND METHODS OF USE THEREOF

<130> 930385.410WO

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<141> 2019-08-12

<150> US 62/718,314
<151> 2018-08-13

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<223> psiCHECK2-HBV plasmid

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ctccacaaca ttccaccaag ctctgcaaga tcccagagtc aggggcctgt attttcctgc 60
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aggacccctg ctcgtgttac aggcggggtt tttcttgttg acaaaaatcc tcacaatacc 240
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aattccagga tcatcaacca ccagcacggg accatgcaaa acctgcacga ctcctgctca 540
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tgtctggctt tcagttatat ggatgatgtg gtattggggg ccaagtctgt acagcatctt 780
gagtcccttt ataccgctgt taccaatttt cttttgtctt tgggtataca tttaaaccct 840
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<210> 6
<211> 681
<212> DNA
<213> Hepatitis B virus

<220>
<223> HBV, genotype A

<400> 6
atggagaaca tcacatcagg attcctagga cccctgctcg tgttacaggc ggggtttttc 60
ttgttgacaa gaatcctcac aataccgcag agtctagact cgtggtggac ttctctcaat 120
tttctagggg gatcacccgt gtgtcttggc caaaattcgc agtccccaac ctccaatcac 180
tcaccaacct cctgtcctcc aatttgtcct ggttatcgct ggatgtgtct gcggcgtttt 240
atcatattcc tcttcatcct gctgctatgc ctcatcttct tattggttct tctggattat 300
caaggtatgt tgcccgtttg tcctctaatt ccaggatcaa caacaaccag tacgggacca 360
tgcaaaacct gcacgactcc tgctcaaggc aactctatgt ttccctcatg ttgctgtaca 420
aaacctacgg atggaaattg cacctgtatt cccatcccat cgtcctgggc tttcgcaaaa 480
tacctatggg agtgggcctc agtccgtttc tcttggctca gtttactagt gccatttgtt 540
cagtggttcg tagggctttc ccccactgtt tggctttcag ctatatggat gatgtggtat 600
tgggggccaa gtctgtacag catcgtgagt ccctttatac cgctgttacc aattttcttt 660
tgtctctggg tatacattta a 681

<210> 7
<211> 681
<212> DNA
<213> Hepatitis B virus

<220>
<223> HBV, genotype C

<400> 7
atggagaaca caacatcagg attcctagga cccctgctcg tgttacaggc ggggtttttc 60
ttgttgacaa gaatcctcac aataccacag agtctagact cgtggtggac ttctctcaat 120
tttctagggg gagcacccac gtgtcctggc caaaattcgc agtccccaac ctccaatcac 180
tcaccaacct cttgtcctcc aatttgtcct ggctatcgct ggatgtgtct gcggcgtttt 240
atcatattcc tcttcatcct gctgctatgc ctcatcttct tgttggttct tctggactac 300
caaggtatgt tgcccgtttg tcctctactt ccaggaacat caactaccag cacgggacca 360
tgcaagacct gcacgattcc tgctcaagga acctctatgt ttccctcttg ttgctgtaca 420
aaaccttcgg acggaaactg cacttgtatt cccatcccat catcctgggc tttcgcaaga 480
ttcctatggg agtgggcctc agtccgtttc tcctggctca gtttactagt gccatttgtt 540
cagtggttcg tagggctttc ccccactgtt tggctttcag ttatatggat gatgtggtat 600
tgggggccaa gtctgtacaa catcttgagt ccctttttac ctctattacc aattttcttt 660
tgtctttggg tatacatttg a 681

<210> 8
<211> 681
<212> DNA
<213> Hepatitis B virus

<220>
<223> HBV, genotype E

<400> 8
atggaaagca tcacatcagg attcctagga cccctgctcg tgttacaggc ggggtttttc 60
ttgttgacaa aaatcctcac aataccgcag agtctagact cgtggtggac ttctctcaat 120
tttctagggg gagctcccgt gtgtcttggc caaaattcgc agtccccaac ctccaatcac 180
tcaccaacct cttgtcctcc aatttgtcct ggctatcgct ggatgtgtct gcggcgtttt 240
atcatcttcc tcttcatcct gctgctatgc ctcatcttct tgttggttct tctggactat 300
caaggtatgt tgcccgtttg tcctctaatt ccaggatcat caaccaccag tacgggaccc 360
tgccgaacct gcacgactct tgctcaagga acctctatgt ttccctcatg ttgctgttca 420
aaaccttcgg acggaaattg cacttgtatt cccatcccat catcatgggc tttcggaaaa 480
ttcctatggg agtgggcctc agcccgtttc tcctggctca gtttactagt gccatttgtt 540
cagtggttcg ccgggctttc ccccactgtc tggctttcag ttatatggat gatgtggtat 600
tgggggccaa gtctgtacaa catcttgagt ccctttatac ctctgttacc aattttcttt 660
tgtctttggg tatacattta a 681

<210> 9
<211> 681
<212> DNA
<213> Hepatitis B virus

<220>
<223> HBV, genotype F

<400> 9
atggacaaca tcacatcagg actcctagga cccctgctcg tgttacaggc ggtgtgtttc 60
ttgttgacaa aaatcctcac aataccacag agtctagact cgtggtggac ttctctcaat 120
tttctagggg gactacccgg gtgtcctggc caaaattcgc agtccccaac ctccaatcac 180
ttaccaacct cctgtcctcc aacttgtcct ggctatcgtt ggatgtgtct gcggcgtttt 240

atcatcttcc tcttcatcct gctgctatgc ctcatcttct tgttggttct tctggactat 300
caaggtatgt tgcccgtttg tcctctactt ccaggatcca cgaccaccag cacgggacca 360
tgcaaaacct gcacaactct tgctcaagga acctctatgt ttccctcctg ttgctgttcc 420
aaaccctcgg acggaaactg cacctgtatt cccatcccat catcttgggc tttaggaaaa 480
tacctatggg agtgggcctc agcccgtttc tcctggctca gtttactagt gcaatttgtt 540
cagtggtgcg tagggctttc ccccactgtc tggcttttag ttatatggat gatctggtat 600
tgggggccaa atctgtgcag catcttgagt ccctttatac cgctgttacc aattttctgt 660
tatctgtggg tatccattta a 681

<210> 10
<211> 19
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic oligonucleotide (sense)

<400> 10
gugugcacuu cgcuucaca 19

<210> 11
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic oligonucleotide (sense)

<400> 11
gugugcactu cgcuucaca 19

<210> 12
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic oligonucleotide (sense)

<400> 12
gugugcactu cgcuucaca 19

<210> 13
<211> 21
<212> RNA
<213> Artificial Sequence

<220>
<223> AD-66810 Antisense

<400> 13
ugugaagcga agugcacacu u 21

<210> 14
<211> 21
<212> RNA
<213> Artificial Sequence

<220>
<223> AD-192282 Antisense

<400> 14
ugugaagcga agugcacacu u 21

<210> 15
<211> 21
<212> RNA
<213> Artificial Sequence

<220>
<223> AD-192289 Antisense

<400> 15
ugugaagcga agugcacacu u 21

<210> 16
<211> 21
<212> RNA
<213> Artificial Sequence

<220>
<223> AD-81890 Antisense

<400> 16
ugugaagcga agugcacacu u 21

<210> 17
<211> 21
<212> RNA
<213> Artificial Sequence

<220>
<223> AD-81892 Antisense

<400> 17
ugugaagcga agugcacacu u 21

<210> 18
<211> 21
<212> RNA

<213> Artificial Sequence

<220>
<223> AD-192283 Antisense

<400> 18
ugugaagcga agugcacacu u 21

<210> 19
<211> 21
<212> RNA
<213> Artificial Sequence

<220>
<223> AD-192291 Antisense

<400> 19
ugugaagcga agugcacacu u 21

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

<220>
<223> AD-192277 Antisense

<400> 20
ugugaagcga agugcacacu u 21

<210> 21
<211> 21
<212> RNA
<213> Artificial Sequence

<220>
<223> AD-192284 Antisense

<400> 21
ugugaagcga agugcacacu u 21

<210> 22
<211> 21
<212> RNA
<213> Artificial Sequence

<220>
<223> AD-192285 Antisense

<400> 22

ugugaagcga agugcacacu u 21

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

<220>
<223> AD-192293 Antisense

<400> 23
ugugaagcga agugcacacu u 21

<210> 24
<211> 21
<212> RNA
<213> Artificial Sequence

<220>
<223> AD-192279 Antisense

<400> 24
ugugaagcga agugcacacu u 21

<210> 25
<211> 21
<212> RNA
<213> Artificial Sequence

<220>
<223> AD-192294 Antisense

<400> 25
ugugaagcga agugcacacu u 21

<210> 26
<211> 21
<212> RNA
<213> Artificial Sequence

<220>
<223> AD-192280 Antisense

<400> 26
ugugaagcga agugcacacu u 21

<210> 27
<211> 21
<212> RNA
<213> Artificial Sequence

<220>
<223> AD-192287 Antisense

<400> 27
ugugaagcga agugcacacu u 21

<210> 28
<211> 21
<212> RNA
<213> Artificial Sequence

<220>
<223> AD-192281 Antisense

<400> 28
ugugaagcga agugcacacu u 21

<210> 29
<211> 19
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic oligonucleotide (sense)

<400> 29
gugugcacuu cgcuucaca 19

<210> 30
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic oligonucleotide (sense)

<400> 30
gugugcactu cgcuucaca 19

<210> 31
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic oligonucleotide (sense)

<400> 31
gugugcactu cgcuucaca 19

<210> 32
<211> 832
<212> PRT
<213> Hepatitis B virus

<220>
<223> HBV P protein (YP_009173866)

<400> 32
Met Pro Leu Ser Tyr Gln His Phe Arg Arg Leu Leu Leu Leu Asp Asp
 1   5   10   15
Glu Ala Gly Pro Leu Glu Glu Glu Leu Pro Arg Leu Ala Asp Glu Gly
            20   25   30
Leu Asn Arg Arg Val Ala Glu Asp Leu Asn Leu Gly Asn Leu Asn Val
        35   40   45
Ser Ile Pro Trp Thr His Lys Val Gly Asn Phe Thr Gly Leu Tyr Ser
    50   55   60
Ser Thr Val Pro Val Phe Asn Pro His Trp Lys Thr Pro Ser Phe Pro
65   70   75   80
Asn Ile His Leu His Gln Asp Ile Ile Lys Lys Cys Glu Gln Phe Val
                85   90   95
Gly Pro Leu Thr Val Asn Glu Lys Arg Arg Leu Gln Leu Ile Met Pro
            100   105   110
Ala Arg Phe Tyr Pro Lys Val Thr Lys Tyr Leu Pro Leu Asp Lys Gly
        115   120   125
Ile Lys Pro Tyr Tyr Pro Glu His Leu Val Asn His Tyr Phe Gln Thr
    130   135   140
Arg His Tyr Leu His Thr Leu Trp Lys Ala Gly Ile Leu Tyr Lys Arg
145   150   155   160
Glu Thr Thr His Ser Ala Ser Phe Cys Gly Ser Pro Tyr Ser Trp Glu
                165   170   175
Gln Asp Leu Gln His Gly Ala Glu Ser Phe His Gln Gln Ser Ser Gly
            180   185   190
Ile Leu Ser Arg Pro Pro Val Gly Ser Ser Leu Gln Ser Lys His Arg
        195   200   205
Lys Ser Arg Leu Gly Leu Gln Ser Gln Gln Gly His Leu Ala Arg Arg
    210   215   220
Gln Gln Gly Arg Ser Trp Ser Ile Arg Ala Gly Phe His Pro Thr Ala
225   230   235   240
Arg Arg Pro Phe Gly Val Glu Pro Ser Gly Ser Gly His Thr Thr Asn
                245   250   255
Phe Ala Ser Lys Ser Ala Ser Cys Leu His Gln Ser Pro Val Arg Lys
            260   265   270
Ala Ala Tyr Pro Ala Val Ser Thr Phe Glu Lys His Ser Ser Ser Gly
        275   280   285
His Ala Val Glu Phe His Asn Leu Pro Pro Asn Ser Ala Arg Ser Gln
    290   295   300
Ser Glu Arg Pro Val Phe Pro Cys Trp Trp Leu Gln Phe Arg Asn Ser
305   310   315   320

```
Lys Pro Cys Ser Asp Tyr Cys Leu Ser Leu Ile Val Asn Leu Leu Glu
                325                 330                 335
Asp Trp Gly Pro Cys Ala Glu His Gly Glu His His Ile Arg Ile Pro
            340                 345                 350
Arg Thr Pro Ser Arg Val Thr Gly Gly Val Phe Leu Val Asp Lys Asn
        355                 360                 365
Pro His Asn Thr Ala Glu Ser Arg Leu Val Val Asp Phe Ser Gln Phe
    370                 375                 380
Ser Arg Gly Asn Tyr Arg Val Ser Trp Pro Lys Phe Ala Val Pro Asn
385                 390                 395                 400
Leu Gln Ser Leu Thr Asn Leu Leu Ser Ser Asn Leu Ser Trp Leu Ser
                405                 410                 415
Leu Asp Val Ser Ala Ala Phe Tyr His Leu Pro Leu His Pro Ala Ala
            420                 425                 430
Met Pro His Leu Leu Val Gly Ser Ser Gly Leu Ser Arg Tyr Val Ala
        435                 440                 445
Arg Leu Ser Ser Asn Ser Arg Ile Leu Asn Asn Gln His Gly Thr Met
    450                 455                 460
Pro Asp Leu His Asp Tyr Cys Ser Arg Asn Leu Tyr Val Ser Leu Leu
465                 470                 475                 480
Leu Leu Tyr Gln Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro
                485                 490                 495
Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro
            500                 505                 510
Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser Val Val Arg Arg
        515                 520                 525
Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp Asp Val Val Leu
    530                 535                 540
Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu Phe Thr Ala Val Thr
545                 550                 555                 560
Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro Asn Lys Thr Lys
                565                 570                 575
Arg Trp Gly Tyr Ser Leu Asn Phe Met Gly Tyr Val Ile Gly Cys Tyr
            580                 585                 590
Gly Ser Leu Pro Gln Glu His Ile Ile Gln Lys Ile Lys Glu Cys Phe
        595                 600                 605
Arg Lys Leu Pro Ile Asn Arg Pro Ile Asp Trp Lys Val Cys Gln Arg
    610                 615                 620
Ile Val Gly Leu Leu Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr
625                 630                 635                 640
Pro Ala Leu Met Pro Leu Tyr Ala Cys Ile Gln Ser Lys Gln Ala Phe
                645                 650                 655
Thr Phe Ser Pro Thr Tyr Lys Ala Phe Leu Cys Lys Gln Tyr Leu Asn
            660                 665                 670
Leu Tyr Pro Val Ala Arg Gln Arg Pro Gly Leu Cys Gln Val Phe Ala
        675                 680                 685
Asp Ala Thr Pro Thr Gly Trp Gly Leu Val Met Gly His Gln Arg Met
    690                 695                 700
Arg Gly Thr Phe Ser Ala Pro Leu Pro Ile His Thr Ala Glu Leu Leu
705                 710                 715                 720
```

```
Ala Ala Cys Phe Ala Arg Ser Arg Ser Gly Ala Asn Ile Ile Gly Thr
                725                 730                 735
Asp Asn Ser Val Val Leu Ser Arg Lys Tyr Thr Ser Phe Pro Trp Leu
            740                 745                 750
Leu Gly Cys Ala Ala Asn Trp Ile Leu Arg Gly Thr Ser Phe Val Tyr
        755                 760                 765
Val Pro Ser Ala Leu Asn Pro Ala Asp Asp Pro Ser Arg Gly Arg Leu
    770                 775                 780
Gly Leu Ser Arg Pro Leu Leu Arg Leu Pro Phe Arg Pro Thr Thr Gly
785                 790                 795                 800
Arg Thr Ser Leu Tyr Ala Asp Ser Pro Ser Val Pro Ser His Leu Pro
                805                 810                 815
Asp Arg Val His Phe Ala Ser Pro Leu His Val Ala Trp Arg Pro Pro
            820                 825                 830
```

<210> 33
<211> 389
<212> PRT
<213> Hepatitis B virus

<220>
<223> HBV S protein (YP_009173869)

<400> 33

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Met Gly Gln Asn Leu Ser Thr Ser Asn Pro Leu Gly Phe Phe Pro Asp
 1               5                  10                  15
His Gln Leu Asp Pro Ala Phe Arg Ala Asn Thr Ala Asn Pro Asp Trp
            20                  25                  30
Asp Phe Asn Pro Asn Lys Asp Thr Trp Pro Asp Ala Asn Lys Val Gly
        35                  40                  45
Ala Gly Ala Phe Gly Leu Gly Phe Thr Pro Pro His Gly Gly Leu Leu
    50                  55                  60
Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Gln Thr Leu Pro Ala Asn
65                  70                  75                  80
Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro
                85                  90                  95
Leu Ser Pro Pro Leu Arg Asn Thr His Pro Gln Ala Met Gln Trp Asn
            100                 105                 110
Ser Thr Thr Phe His Gln Thr Leu Gln Asp Pro Arg Val Arg Gly Leu
        115                 120                 125
Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val Asn Pro Val Leu
    130                 135                 140
Thr Thr Ala Ser Pro Leu Ser Ser Ile Phe Ser Arg Ile Gly Asp Pro
145                 150                 155                 160
Ala Leu Asn Met Glu Asn Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu
                165                 170                 175
Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro
            180                 185                 190
Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr
        195                 200                 205
```

```
Thr Val Cys Leu Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser
    210                 215                 220
Pro Thr Ser Cys Pro Pro Thr Cys Pro Gly Tyr Arg Trp Met Cys Leu
225                 230                 235                 240
Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe
                245                 250                 255
Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu
            260                 265                 270
Ile Pro Gly Ser Ser Thr Thr Ser Thr Gly Pro Cys Arg Thr Cys Met
        275                 280                 285
Thr Thr Ala Gln Gly Thr Ser Met Tyr Pro Ser Cys Cys Cys Thr Lys
    290                 295                 300
Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala
305                 310                 315                 320
Phe Gly Lys Phe Leu Trp Glu Trp Ala Ser Ala Arg Phe Ser Trp Leu
                325                 330                 335
Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr
            340                 345                 350
Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu
        355                 360                 365
Tyr Ser Ile Leu Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys
    370                 375                 380
Leu Trp Val Tyr Ile
385
```

<210> 34
<211> 281
<212> PRT
<213> Hepatitis B virus

<220>
<223> HBV PreS2 protein (YP_009173870.1)

<400> 34

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Met Gln Trp Asn Ser Thr Thr Phe His Gln Thr Leu Gln Asp Pro Arg
 1               5                  10                  15
Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
            20                  25                  30
Asn Pro Val Leu Thr Thr Ala Ser Pro Leu Ser Ser Ile Phe Ser Arg
        35                  40                  45
Ile Gly Asp Pro Ala Leu Asn Met Glu Asn Ile Thr Ser Gly Phe Leu
    50                  55                  60
Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
65                  70                  75                  80
Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
                85                  90                  95
Leu Gly Gly Thr Thr Val Cys Leu Gly Gln Asn Ser Gln Ser Pro Thr
            100                 105                 110
Ser Asn His Ser Pro Thr Ser Cys Pro Pro Thr Cys Pro Gly Tyr Arg
        115                 120                 125
```

```
Trp Met Cys Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu
    130                 135                 140
Cys Leu Ile Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro
145                 150                 155                 160
Val Cys Pro Leu Ile Pro Gly Ser Ser Thr Thr Ser Thr Gly Pro Cys
                165                 170                 175
Arg Thr Cys Met Thr Thr Ala Gln Gly Thr Ser Met Tyr Pro Ser Cys
            180                 185                 190
Cys Cys Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro
        195                 200                 205
Ser Ser Trp Ala Phe Gly Lys Phe Leu Trp Glu Trp Ala Ser Ala Arg
    210                 215                 220
Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly
225                 230                 235                 240
Leu Ser Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp
                245                 250                 255
Gly Pro Ser Leu Tyr Ser Ile Leu Ser Pro Phe Leu Pro Leu Leu Pro
            260                 265                 270
Ile Phe Phe Cys Leu Trp Val Tyr Ile
        275                 280
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<210> 35
<211> 226
<212> PRT
<213> Hepatitis B virus

<220>
<223> HBV S protein (YP_009173871.1)

<400> 35

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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 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

<210> 36
<211> 154
<212> PRT
<213> Hepatitis B virus

<220>
<223> HBV X protein (YP_009173867.1)

<400> 36
Met Ala Ala Arg Leu Cys Cys Gln Leu Asp Pro Ala Arg Asp Val Leu
 1   5   10   15
Cys Leu Arg Pro Val Gly Ala Glu Ser Cys Gly Arg Pro Phe Ser Gly
            20   25   30
Ser Leu Gly Thr Leu Ser Ser Pro Ser Pro Ser Ala Val Pro Thr Asp
        35   40   45
His Gly Ala His Leu Ser Leu Arg Gly Leu Pro Val Cys Ala Phe Ser
    50   55   60
Ser Ala Gly Pro Cys Ala Leu Arg Phe Thr Ser Ala Arg Arg Met Glu
65   70   75   80
Thr Thr Val Asn Ala His Gln Ile Leu Pro Lys Val Leu His Lys Arg
                85   90   95
Thr Leu Gly Leu Ser Ala Met Ser Thr Thr Asp Leu Glu Ala Tyr Phe
            100   105   110
Lys Asp Cys Leu Phe Lys Asp Trp Glu Glu Leu Gly Glu Glu Ile Arg
        115   120   125
Leu Lys Val Phe Val Leu Gly Gly Cys Arg His Lys Leu Val Cys Ala
    130   135   140
Pro Ala Pro Cys Asn Phe Phe Thr Ser Ala
145   150

<210> 37
<211> 212
<212> PRT
<213> Hepatitis B virus

<220>
<223> HBV PreC protein (YP_009173857.1)

<400> 37

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Met Gln Leu Phe His Leu Cys Leu Ile Ile Ser Cys Ser Cys Pro Thr
 1               5                  10                  15
Val Gln Ala Ser Lys Leu Cys Leu Gly Trp Leu Trp Gly Met Asp Ile
            20                  25                  30
Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu Ser Phe Leu
        35                  40                  45
Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser
    50                  55                  60
Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys Ser Pro His
65                  70                  75                  80
His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu Met Thr
                85                  90                  95
Leu Ala Thr Trp Val Gly Val Asn Leu Glu Asp Pro Ala Ser Arg Asp
            100                 105                 110
Leu Val Val Ser Tyr Val Asn Thr Asn Met Gly Leu Lys Phe Arg Gln
        115                 120                 125
Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg Glu Thr Val
    130                 135                 140
Ile Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala
145                 150                 155                 160
Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu Thr Thr
                165                 170                 175
Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro
            180                 185                 190
Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg
        195                 200                 205
Glu Ser Gln Cys
    210
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<210> 38
<211> 843
<212> PRT
<213> Hepatitis B virus

<220>
<223> HBV pol protein (BAA32913.1)

<400> 38

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Met Pro Leu Ser Tyr Gln His Phe Arg Lys Leu Leu Leu Leu Asp Asp
 1               5                  10                  15
Glu Ala Gly Pro Leu Glu Glu Glu Leu Pro Arg Leu Ala Asp Glu Gly
            20                  25                  30
Leu Asn Arg Arg Val Ala Glu Asp Leu Asn Leu Gly Asn Leu Asn Val
        35                  40                  45
Ser Ile Pro Trp Thr His Lys Val Gly Asn Phe Thr Gly Leu Tyr Ser
    50                  55                  60
Ser Thr Val Pro Val Phe Asn Pro Glu Trp Gln Thr Pro Ser Phe Pro
65                  70                  75                  80
His Ile His Leu Gln Glu Asp Ile Ile Asn Arg Cys Gln Gln Tyr Val
                85                  90                  95
```

```
Gly Pro Leu Thr Val Asn Glu Lys Arg Arg Leu Lys Leu Ile Met Pro
            100                 105                 110
Ala Arg Phe Tyr Pro Asn Leu Thr Lys Tyr Leu Pro Leu Asp Lys Gly
        115                 120                 125
Ile Lys Pro Tyr Tyr Pro Glu His Ala Val Asn His Tyr Phe Lys Thr
    130                 135                 140
Arg His Tyr Leu His Thr Leu Trp Lys Ala Gly Ile Leu Tyr Lys Arg
145                 150                 155                 160
Glu Thr Thr Arg Ser Ala Ser Phe Cys Gly Ser Pro Tyr Ser Trp Glu
                165                 170                 175
Gln Glu Leu Gln His Gly Arg Leu Val Phe Gln Thr Ser Thr Arg His
            180                 185                 190
Gly Asp Lys Ser Phe Cys Ser Gln Ser Ser Gly Ile Leu Ser Arg Ser
        195                 200                 205
Pro Val Gly Pro Cys Val Arg Ser Gln Leu Lys Gln Ser Arg Leu Gly
    210                 215                 220
Leu Gln Pro Gln Gln Gly Ser Leu Ala Arg Gly Lys Ser Gly Arg Ser
225                 230                 235                 240
Gly Ser Ile Arg Ala Arg Val His Pro Thr Thr Arg Arg Ser Phe Gly
                245                 250                 255
Val Glu Pro Ser Gly Ser Gly His Ile Asp Asn Ser Ala Ser Ser Thr
            260                 265                 270
Ser Ser Cys Leu His Gln Ser Ala Val Arg Lys Thr Ala Tyr Ser His
        275                 280                 285
Leu Ser Thr Ser Lys Arg Gln Ser Ser Ser Gly His Ala Val Glu Leu
    290                 295                 300
His His Ile Pro Pro Ser Ser Ala Thr Pro Gln Ser Lys Gly Pro Ile
305                 310                 315                 320
Leu Ser Cys Trp Trp Leu Gln Phe Arg Asn Ser Lys Pro Cys Ser Asp
                325                 330                 335
Tyr Cys Leu Ser His Ile Val Asn Leu Leu Glu Asp Trp Gly Pro Cys
            340                 345                 350
Thr Glu His Gly Glu His Asn Ile Arg Ile Pro Arg Thr Pro Ala Arg
        355                 360                 365
Val Thr Gly Gly Val Phe Leu Val Asp Lys Asn Pro His Asn Thr Thr
    370                 375                 380
Glu Ser Arg Leu Val Val Asp Phe Ser Gln Phe Ser Arg Gly Ser Thr
385                 390                 395                 400
His Val Ser Trp Pro Lys Phe Ala Val Pro Asn Leu Gln Ser Leu Thr
                405                 410                 415
Asn Leu Leu Ser Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala
            420                 425                 430
Ala Phe Tyr His Ile Pro Leu His Pro Ala Ala Met Pro His Leu Leu
        435                 440                 445
Val Gly Ser Ser Gly Leu Pro Arg Tyr Val Ala Arg Leu Ser Ser Thr
    450                 455                 460
Ser Arg Asn Ile Asn Tyr Gln His Gly Thr Met Gln Asp Leu His Asp
465                 470                 475                 480
Ser Cys Ser Arg His Leu Tyr Val Ser Leu Leu Leu Leu Tyr Lys Thr
                485                 490                 495
```

```
Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe
            500                 505                 510
Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu Ala Gln
        515                 520                 525
Phe Thr Ser Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys
    530                 535                 540
Leu Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly Ala Lys Ser Val
545                 550                 555                 560
Gln His Leu Glu Ser Leu Phe Thr Ala Val Thr Asn Phe Leu Leu Ser
                565                 570                 575
Leu Gly Ile His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser
            580                 585                 590
Leu Asn Phe Met Gly Tyr Val Ile Gly Ser Trp Gly Thr Leu Pro Gln
        595                 600                 605
Asp His Ile Val Leu Lys Ile Lys Gln Cys Phe Arg Lys Leu Pro Val
    610                 615                 620
Asn Arg Pro Ile Asp Trp Lys Val Cys Gln Arg Ile Val Gly Leu Leu
625                 630                 635                 640
Gly Phe Ala Ala Pro Phe Thr Gln Cys Gly Tyr Pro Ala Leu Met Pro
                645                 650                 655
Leu Tyr Ala Cys Ile Gln Ser Lys Gln Ala Phe Thr Phe Ser Pro Thr
            660                 665                 670
Tyr Lys Ala Phe Leu Cys Lys Gln Tyr Leu Asn Leu Tyr Pro Val Ala
        675                 680                 685
Arg Gln Arg Ser Gly Leu Cys Gln Val Phe Ala Asp Ala Thr Pro Thr
    690                 695                 700
Gly Trp Gly Leu Ala Ile Gly His Arg Arg Met Arg Gly Thr Phe Val
705                 710                 715                 720
Ala Pro Leu Pro Ile His Thr Ala Glu Leu Leu Ala Ala Cys Phe Ala
                725                 730                 735
Arg Ser Arg Ser Gly Ala Lys Leu Ile Gly Thr Asp Asn Ser Val Val
            740                 745                 750
Leu Ser Arg Lys Tyr Thr Ser Phe Pro Trp Leu Leu Gly Cys Ala Ala
        755                 760                 765
Asn Trp Ile Leu Arg Gly Thr Ser Phe Val Tyr Val Pro Ser Ala Leu
    770                 775                 780
Asn Pro Ala Asp Asp Pro Ser Arg Gly Arg Leu Gly Leu Tyr Arg Pro
785                 790                 795                 800
Leu Leu His Leu Pro Phe Arg Pro Thr Thr Gly Arg Thr Ser Leu Tyr
                805                 810                 815
Ala Val Ser Pro Ser Val Pro Ser His Leu Pro Asp Arg Val His Phe
            820                 825                 830
Ala Ser Pro Leu His Val Ala Trp Arg Pro Pro
        835                 840
```

<210> 39
<211> 400
<212> PRT
<213> Hepatitis B virus

<220>
<223> HBV envelope protein (BAA32914.1)

<400> 39
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 Thr Leu Thr Thr Val Pro Val 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 His 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

<210> 40
<211> 210
<212> PRT
<213> Hepatitis B virus

<220>
<223> HBV X protein (BAA32912.1)

<400> 40
Met Gly Leu Gly Tyr Trp Pro Ser Pro His Ala Trp Asn Leu Cys Gly
 1   5   10   15
Ser Ser Ala Asp Pro Tyr Cys Gly Thr Pro Ser Ser Leu Phe Cys Ser
            20   25   30
Gln Pro Val Trp Ser Glu Thr Asp Arg Asn Gly Gln Leu Cys Cys Ser
        35   40   45
Leu Ser Glu Ile His Leu Leu Ser Met Ala Ala Arg Val Cys Cys Gln
    50   55   60
Leu Asp Pro Ala Arg Asp Val Leu Cys Leu Arg Pro Val Gly Ala Glu
65   70   75   80
Ser Arg Gly Arg Pro Ile Ser Gly Pro Phe Gly Ser Leu Pro Ser Pro
                85   90   95
Ser Ser Ser Ala Val Pro Ala Asp His Gly Ala His Leu Ser Leu Arg
            100   105   110
Gly Leu Pro Val Cys Ala Phe Ser Ser Ala Gly Pro Cys Ala Leu Arg
        115   120   125
Phe Thr Ser Ala Arg Arg Met Glu Thr Thr Val Asn Ala His Gln Val
    130   135   140
Leu Pro Lys Val Leu Tyr Lys Arg Thr Leu Gly Leu Ser Ala Met Ser
145   150   155   160
Thr Thr Asp Leu Glu Ala Tyr Phe Lys Asp Cys Leu Phe Lys Asp Trp
                165   170   175
Glu Glu Leu Gly Glu Glu Ile Arg Leu Met Ile Phe Val Leu Gly Gly
            180   185   190
Cys Arg His Lys Leu Val Cys Ser Pro Ala Pro Cys Asn Phe Phe Thr
        195   200   205
Ser Ala
    210

<210> 41
<211> 389
<212> PRT
<213> Hepatitis B virus

<220>
<223> HBV Large S protein (P03138.3)

<400> 41
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Met Gly Gln Asn Leu Ser Thr Ser Asn Pro Leu Gly Phe Phe Pro Asp
 1               5                  10                  15
His Gln Leu Asp Pro Ala Phe Arg Ala Asn Thr Ala Asn Pro Asp Trp
            20                  25                  30
Asp Phe Asn Pro Asn Lys Asp Thr Trp Pro Asp Ala Asn Lys Val Gly
        35                  40                  45
Ala Gly Ala Phe Gly Leu Gly Phe Thr Pro Pro His Gly Gly Leu Leu
    50                  55                  60
Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Gln Thr Leu Pro Ala Asn
65                  70                  75                  80
Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro
                85                  90                  95
Leu Ser Pro Pro Leu Arg Asn Thr His Pro Gln Ala Met Gln Trp Asn
            100                 105                 110
Ser Thr Thr Phe His Gln Thr Leu Gln Asp Pro Arg Val Arg Gly Leu
        115                 120                 125
Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val Asn Pro Val Leu
    130                 135                 140
Thr Thr Ala Ser Pro Leu Ser Ser Ile Phe Ser Arg Ile Gly Asp Pro
145                 150                 155                 160
Ala Leu Asn Met Glu Asn Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu
                165                 170                 175
Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro
            180                 185                 190
Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr
        195                 200                 205
Thr Val Cys Leu Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser
    210                 215                 220
Pro Thr Ser Cys Pro Pro Thr Cys Pro Gly Tyr Arg Trp Met Cys Leu
225                 230                 235                 240
Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe
                245                 250                 255
Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu
            260                 265                 270
Ile Pro Gly Ser Ser Thr Thr Ser Thr Gly Pro Cys Arg Thr Cys Met
        275                 280                 285
Thr Thr Ala Gln Gly Thr Ser Met Tyr Pro Ser Cys Cys Cys Thr Lys
    290                 295                 300
Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala
305                 310                 315                 320
Phe Gly Lys Phe Leu Trp Glu Trp Ala Ser Ala Arg Phe Ser Trp Leu
                325                 330                 335
Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr
            340                 345                 350
Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu
        355                 360                 365
Tyr Ser Ile Leu Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys
    370                 375                 380
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Leu Trp Val Tyr Ile
385

<210> 42
<211> 183
<212> PRT
<213> Hepatitis B virus

<220>
<223> HBV Core protein (P03146.1)

<400> 42
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 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> 43
<211> 3182
<212> DNA
<213> Hepatitis B virus

<220>
<223> Hepatitis B virus (strain ayw) genome

<400> 43
aattccactg catggcctga ggatgagtgt ttctcaaagg tggagacagc ggggtaggct   60
gccttcctga ctggcgattg gtggaggcag gaggcggatt tgctggcaaa gtttgtagta   120
tgccctgagc ctgagggctc caccccaaaa ggcctccgtg cggtggggtg aaacccagcc   180
cgaatgctcc agctcctacc ttgttggcgt ctggccaggt gtccttgttg ggattgaagt   240

cccaatctgg atttgcggtg tttgctctga aggctggatc caactggtgg tcgggaaaga 300
atcccagagg attgctggtg gaaagattct gccccatgct gtagatcttg ttcccaagaa 360
tatggtgacc cacaaaatga ggcgctatgt gttgtttctc tcttatataa tatacccgcc 420
ttccatagag tgtgtaaata gtgtctagtt tggaagtaat gattaactag atgttctgga 480
taataaggtt taataccctt atccaatggt aaatatttgg taacctttgg ataaaacctg 540
gcaggcataa tcaattgcaa tcttcttttc tcattaactg tgagtgggcc tacaaactgt 600
tcacattttt tgataatgtc ttggtgtaaa tgtatattag gaaaagatgg tgttttccaa 660
tgaggattaa agacaggtac agtagaagaa taaagcccag taaagttccc caccttatga 720
gtccaaggaa tactaacatt gagattcccg agattgagat cttctgcgac gcggcgattg 780
agaccttcgt ctgcgaggcg agggagttct tcttctaggg gacctgcctc gtcgtctaac 840
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agtgcgaatc cacactccga aagacaccaa atactctata actgtttctc ttccaaaagt 960
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gattgacgat aagggagagg cagtagtcag aacagggttt actgttcctg aactggagcc 3120
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gg 3182

<210> 44
<211> 3182
<212> DNA
<213> Artificial Sequence

<220>
<223> Reverse complement of SEQ ID NO: 16

<400> 44
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tcttctcgag gattggggac cctgcgctga acatggagaa catcacatca ggattcctag 180
gaccccttct cgtgttacag gcggggtttt tcttgttgac aagaatcctc acaataccgc 240
agagtctaga ctcgtggtgg acttctctca attttctagg gggaactacc gtgtgtcttg 300
gccaaaattc gcagtcccca acctccaatc actcaccaac ctcttgtcct ccaacttgtc 360
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gcctcatctt cttgttggtt cttctggact atcaaggtat gttgcccgtt tgtcctctaa 480
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<211> 389
<212> PRT
<213> Hepatitis B virus

<220>
<223> HBV S protein (P03142.4)

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Asp Phe Asn Pro Ile Lys Asp His Trp Pro Ala Ala Asn Gln Val Gly
        35   40   45
Val Gly Ala Phe Gly Pro Gly Leu Thr Pro Pro His Gly Gly Ile Leu
    50   55   60
Gly Trp Ser Pro Gln Ala Gln Gly Ile Leu Thr Thr Val Ser Thr Ile
65   70   75   80
Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro
                85   90   95
Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn
            100   105   110
Ser Thr Ala Leu His Gln Ala Leu Gln Asp Pro Arg Val Arg Gly Leu
        115   120   125
Tyr Leu Pro Ala Gly Gly Ser Ser Ser Gly Thr Val Asn Pro Ala Pro
    130   135   140
Asn Ile Ala Ser His Ile Ser Ser Ile Ser Ala Arg Thr Gly Asp Pro
145   150   155   160
Val Thr Ile Met Glu Asn Ile Thr Ser Gly Phe Leu Gly Pro Leu Leu
                165   170   175
Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro
            180   185   190
Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Ser
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Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe
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Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu
            260                 265                 270
Ile Pro Gly Ser Thr Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr
        275                 280                 285
Thr Pro Ala Gln Gly Asn Ser Lys Phe Pro Ser Cys Cys Cys Thr Lys
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Pro Thr Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala
305                 310                 315                 320
Phe Ala Lys Tyr Leu Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu
                325                 330                 335
Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr
            340                 345                 350
Val Trp Leu Ser Ala Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu
        355                 360                 365
Tyr Ser Ile Val Ser Pro Phe Ile Pro Leu Leu Pro Ile Phe Phe Cys
    370                 375                 380
Leu Trp Val Tyr Ile
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<211> 185
<212> PRT
<213> Hepatitis B virus

<220>
<223> HBV Core protein (P03149.1)

<400> 46

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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 Asn Asn Leu Gln Asp Pro Ala
65                  70                  75                  80
Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr 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
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Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
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Glu Thr Thr Val Val Arg Arg Arg Asp Arg Gly Arg Ser Pro Arg Arg
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Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg
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Arg Ser Gln Ser Arg Glu Ser Gln Cys
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<210> 47
<211> 3200
<212> DNA
<213> Hepatitis B virus

<220>
<223> Hepatitis B virus complete DNA sequence (subtype adw)

<400> 47

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<211> 3200
<212> DNA
<213> Artificial Sequence

<220>
<223> Reverse complement of SEQ ID NO: 47

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<211> 3182
<212> DNA
<213> Hepatitis B virus

<220>
<223> Hepatitis B virus subtype ayw, complete genome

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