SEQUENCE LISTING

<110> Melbourne Health (all states except US)
Austin and Repatriation Medical Centre (all states except US)
Southern Health (all states except US)
Bartholomeusz, Angeline (US only)
Locarnini, Stephen (US only)
Ayres, Anna (US only)
Angus, Peter (US only)
Sievert, William (US only)

<120> Viral Variants and uses thereof

<130> 2609536/EJH

<140> Not yet available
<141> 2003-02-07

<150> AU PS0370
<151> 2002-02-07

<150> AU PS1269
<151> 2002-03-21

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<170> PatentIn version 3.1

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20 25 30

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

Ser Gln Phe Ser Arg Gly Xaa Xaa Xaa Val Ser Trp Pro Lys Phe Ala
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Val Pro Asn Leu Xaa Ser Leu Thr Asn Leu Leu Ser
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Gly Leu Xaa Arg Tyr Val Ala Arg Leu Ser Ser Xaa Ser Xaa Xaa Xaa
35 40 45

Asn Xaa Gln Xaa Xaa Xaa Xaa Xaa Xaa Leu His Xaa Xaa Cys Ser Arg
50 55 60

Xaa Leu Tyr Val Ser Leu Xaa Leu Leu Tyr Xaa Thr Xaa Gly Xaa Lys
65 70 75 80

Leu His Leu Xaa Xaa His Pro Ile Xaa Leu Gly Phe Arg Lys Xaa Pro
85 90 95

Met Gly Xaa Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala
100 105 110

Ile Xaa Xaa Xaa Xaa Xaa Arg Ala Phe Xaa His Cys Xaa Xaa Phe Xaa
115 120 125

Tyr Met Asp Asp Xaa Val Leu Gly Ala Xaa Xaa Xaa Xaa His Xaa Glu
130 135 140

Xaa Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Leu Xaa Xaa Gly Ile His
145 150 155 160

Leu Asn Pro Xaa Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met
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Gly Tyr Xaa Ile Gly
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tgggagtggg cctcagcccg tttctcatgg ctcagtttac tagygccatt tgttcagtgg 360

ttcgtagggc tttcccccac tgtttggctt ttagttatrt ggatgatgtg gtattggggg 420

ccaagtctgt acagcacctt gagtcccttt ttaccgctgt taccaatttt cttttgtctt 480

tgggtataca tttaaaccct aacaaaacta aaagatgggg ttattcctta aatttcatgg 540

gctatgtcat tggatgttat gggtcattgc cacaagatca catcatacag aaaatcaaag 600

aatgttttag gaaacttcnn gtgngcggga ntggaacaga tcca 644

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gcccgtctgt cctctaattc caggatcttc aaccaccagc gcgggaccat gcagaacctg 180

cacgactact gctcaaggaa cctctatgta tccctcctgt tgctgtacca aaccttcgga 240

cggaaattgc acctgtattc ccatcccatc atcttgggct ttcggaaaat tcctatggga 300

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agggctttcc cccactgttt ggctttcagt tatgtggatg atgtggtatt gggggccaag 420

tctgtacagc accttgagtc ccttttacc gctgttacca attttctttt gtctttgggt 480

atacatttaa accctaacaa aactaaaaga tggggttatt ccttaaattt catgggctat 540

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gcccgtctgt cctctaattc caggatcttc aaccaccagc gcgggaccat gcagaacctg 180

cacgactact gctcaaggaa cctctatgta tccctcctgt tgctgtacca aaccttcgga 240

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agggctttcc cccactgttt ggctttyagt tatgtggatg atgtggtatt gggggccaag 420

tctgtacagc accttgagtc ccttttacc gctgttacca attttctttt gtctttgggt 480

atacatttaa accctaacaa aactaaaaga tggggttatt ccttaaattt catgggctat 540

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cgactactgc tcaaggaacc tctatgtatc cctcctgttg ctgtaccaaa ccttcggacg 240

gaaattgcac ctgtattccc atcccatcat cttgggcttt cggaaaattc ctatgggagt 300

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ccgtctgtcc tctaattcca ggatcttcaa ccaccagcgc gggaccatgc agaacctgca 180

cgactactgc tcaaggaacc tctatgtatc cctcctgttg ctgtaccaaa ccttcggacg 240

gaaattgcac ctgtattccc atcccatcat cttgggcttt cggaaaattc ctatgggakt 300

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catgcagtgg aactccacaa ctttccacca aactctgcaa gatcccaggg tgaggggcct 180

gtatctccct gctggtggct ccagttcagg aacagtaaac cctgttccga ctactgcctc 240

tcccatatcg tcaatcttct cgaggattgg ggaccttgcg ctgaacatgg agaacatcac 300

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cctcacaata ccgcagagtc tagactcgtg gtggacttct ctcaattttc taggggaac 420

caccgtgtgt cttggccaaa attcgcagtc cccaacctcc aatcactcac caacctcctg 480

tcctccaact tgtcctggtt atcgctggat gtgtctgcgg cgttttatca tattcctctt 540

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cgtctgtcct ctaattccag gatcttcaac caccagcgcg ggaccatgca gaacctgcac 660

gactactgct caaggaacct ctatgtatcc ctcctgttgc tgtaccaaac cttcggacgg 720

aaattgcacc tgtattccca tcccatcatc ttgggctttc ggaaaactcc tatgggattg 780

ggcctcagcc cgtttctcat ggctcagttt actagtgcca tttgttcagt ggttcgtagg 840

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attggatg 1028

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Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Asn Ser Arg Ile Phe
35 40 45

Asn His Gln Arg Gly Thr Met Gln Asn Leu His Asp Tyr Cys Ser Arg
50 55 60

Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Gln Thr Phe Gly Arg Lys
65 70 75 80

Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro
85 90 95

Met Gly Val Gly Leu Ser Pro Phe Leu Met Ala Gln Phe Thr Ser Ala
100 105 110

Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser
115 120 125

Tyr Xaa Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu Glu
130 135 140

Ser Leu Phe Thr Ala Val Thr Asn Phe Leu Leu Ser Leu Gly Ile His
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Gly Tyr Val Ile Gly
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35 40 45

Ile Phe Asn His Gln Arg Gly Thr Met Gln Asn Leu His Asp Tyr Cys
50 55 60

Ser Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Gln Thr Phe Gly
65 70 75 80

Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys
85 90 95

Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Met Ala Gln Phe Thr
100 105 110

Ser Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu Ala
115 120 125

Phe Ser Tyr Val Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln His
130 135 140

Leu Glu Ser Leu Phe Thr Ala Val Thr Asn Phe Leu Leu Ser Leu Gly
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Ser Ser Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Asn Ser Arg
35 40 45

Ile Phe Asn His Gln Arg Gly Thr Met Gln Asn Leu His Asp Tyr Cys
50 55 60

Ser Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Gln Thr Phe Gly
65 70 75 80

Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys
85 90 95

Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Met Ala Gln Phe Thr
100 105 110

Ser Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu Ala
115 120 125

Phe Ser Tyr Val Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln His
130 135 140

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

Ile His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn
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Ser Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Asn Ser Arg Ile
        35                  40                  45

Phe Asn His Gln Arg Gly Thr Met Gln Asn Leu His Asp Tyr Cys Ser
    50                  55                  60

Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Gln Thr Phe Gly Arg
65                  70                  75                  80

Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile
                85                  90                  95

Pro Met Gly Val Gly Leu Ser Pro Phe Leu Met Ala Gln Phe Thr Ser
            100                 105                 110

Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe
        115                 120                 125

Ser Tyr Val Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu
    130                 135                 140

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

His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe
                165                 170                 175
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Met Gly Tyr Val Ile Gly Cys Tyr
180

<210> 23
<211> 184
<212> PRT
<213> Pol Trans of TR5

<220>
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<222> (100)..(100)
<223> X = any amino acid

<400> 23

Ser Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr
1 5 10 15

His Ile Pro Leu His Pro Ala Ala Met Pro His Leu Leu Val Gly Ser
20 25 30

Ser Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Asn Ser Arg Ile
35 40 45

Phe Asn His Gln Arg Gly Thr Met Gln Asn Leu His Asp Tyr Cys Ser
50 55 60

Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Gln Thr Phe Gly Arg
65 70 75 80

Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile
85 90 95

Pro Met Gly Xaa Gly Leu Ser Pro Phe Leu Met Ala Gln Phe Thr Ser
100 105 110

Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe
115 120 125

Ser Tyr Val Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu
130 135 140

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

```
His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe
                165                 170                 175

Met Gly Tyr Val Ile Gly Cys Tyr
            180

<210>  24
<211>  326
<212>  PRT
<213>  Pol Trans of TR6

<220>
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<222>  (168)..(168)
<223>  X = any amino acid

<400>  24

Ile Tyr Gln Ser Pro Val Arg Lys Ala Ala Tyr Pro Ala Val Ser Thr
1               5                   10                  15

Phe Glu Arg Leu Ser Ser Ser Gly His Ala Val Glu Leu His Asn Phe
            20                  25                  30

Pro Pro Asn Ser Ala Arg Ser Gln Gly Glu Gly Pro Val Ser Pro Cys
        35                  40                  45

Trp Trp Leu Gln Phe Arg Asn Ser Lys Pro Cys Ser Asp Tyr Cys Leu
    50                  55                  60

Ser His Ile Val Asn Leu Leu Glu Asp Trp Gly Pro Cys Ala Glu His
65                  70                  75                  80

Gly Glu His His Ile Arg Ile Pro Arg Thr Pro Ala Arg Val Thr Gly
                85                  90                  95

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

Leu Val Val Asp Phe Ser Gln Phe Ser Arg Gly Asn His Arg Val Ser
        115                 120                 125
```

Trp Pro Lys Phe Ala Val Pro Asn Leu Gln Ser Leu Thr Asn Leu Leu
130 135 140

Ser Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr
145 150 155 160

His Ile Pro Leu His Pro Ala Xaa Met Pro His Leu Leu Val Gly Ser
165 170 175

Ser Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Asn Ser Arg Ile
180 185 190

Phe Asn His Gln Arg Gly Thr Met Gln Asn Leu His Asp Tyr Cys Ser
195 200 205

Arg Asn Leu Tyr Val Ser Leu Leu Leu Leu Tyr Gln Thr Phe Gly Arg
210 215 220

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

Pro Met Gly Leu Gly Leu Ser Pro Phe Leu Met Ala Gln Phe Thr Ser
245 250 255

Ala Ile Cys Ser Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe
260 265 270

Ser Tyr Val Asp Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu
275 280 285

Glu Ser Leu Phe Thr Ala Val Thr Asn Phe Leu Leu Ser Leu Gly Ile
290 295 300

His Leu Asn Pro Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe
305 310 315 320

Val Gly Tyr Val Ile Gly
325

<210> 25
<211> 161
<212> PRT

<213> HBsAg Trans of TR1

<220>
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<222> (111)..(111)
<223> X = any amino acid

<220>
<221> misc_feature
<222> (129)..(129)
<223> X = any amino acid

<400> 25

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Pro Thr Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile
1               5                  10                  15

Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu
            20                  25                  30

Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly Ser Ser
        35                  40                  45

Thr Thr Ser Ala Gly Pro Cys Arg Thr Cys Thr Thr Thr Ala Gln Gly
    50                  55                  60

Thr Ser Met Tyr Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn
65                  70                  75                  80

Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Gly Lys Phe Leu
                85                  90                  95

Trp Glu Trp Ala Ser Ala Arg Phe Ser Trp Leu Ser Leu Leu Xaa Pro
            100                 105                 110

Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Leu Val
        115                 120                 125

Xaa Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Thr Leu Ser
    130                 135                 140

Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile
145                 150                 155                 160
```

Asn

<210> 26
<211> 162
<212> PRT
<213> HBsAg Trans of TR2

<220>
<221> misc_feature
<222> (113)..(113)
<223> X = any amino acid

<400> 26

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Cys Pro Pro Thr Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe
1               5                  10                  15

Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val
            20                  25                  30

Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly
        35                  40                  45

Ser Ser Thr Thr Ser Ala Gly Pro Cys Arg Thr Cys Thr Thr Thr Ala
    50                  55                  60

Gln Gly Thr Ser Met Tyr Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp
65                  70                  75                  80

Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Gly Lys
                85                  90                  95

Phe Leu Trp Glu Trp Ala Ser Ala Arg Phe Ser Trp Leu Ser Leu Leu
            100                 105                 110

Xaa Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu
        115                 120                 125

Ser Val Met Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Thr
    130                 135                 140

Leu Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val
```

145 150 155 160

Tyr Ile

<210> 27
<211> 162
<212> PRT
<213> HBsAg Trans of TR3

<220>
<221> misc_feature
<222> (129)..(129)
<223> X = any amino acid

<400> 27

Cys Pro Pro Thr Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe
1 5 10 15

Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val
20 25 30

Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly
35 40 45

Ser Ser Thr Thr Ser Ala Gly Pro Cys Arg Thr Cys Thr Thr Thr Ala
50 55 60

Gln Gly Thr Ser Met Tyr Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp
65 70 75 80

Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Gly Lys
85 90 95

Phe Leu Trp Glu Trp Ala Ser Ala Arg Phe Ser Trp Leu Ser Leu Leu
100 105 110

Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu
115 120 125

Xaa Val Met Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Thr
130 135 140

Leu Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val
145 150 155 160

Tyr Ile

<210> 28
<211> 161
<212> PRT
<213> HBsAg Trans of TR4

<400> 28

Pro Pro Thr Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile
1 5 10 15

Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu
20 25 30

Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly Ser
35 40 45

Ser Thr Thr Ser Ala Gly Pro Cys Arg Thr Cys Thr Thr Thr Ala Gln
50 55 60

Gly Thr Ser Met Tyr Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly
65 70 75 80

Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Gly Lys Phe
85 90 95

Leu Trp Glu Trp Ala Ser Ala Arg Phe Ser Trp Leu Ser Leu Leu Val
100 105 110

Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser
115 120 125

Val Met Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Thr Leu
130 135 140

Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr
145 150 155 160

Ile

<210> 29
<211> 161
<212> PRT
<213> HBsAg Trans of TR5

<220>
<221> misc_feature
<222> (99)..(99)
<223> X = any amino acid

<400> 29

Pro Pro Thr Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile
1 5 10 15

Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu
20 25 30

Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly Ser
35 40 45

Ser Thr Thr Ser Ala Gly Pro Cys Arg Thr Cys Thr Thr Thr Ala Gln
50 55 60

Gly Thr Ser Met Tyr Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly
65 70 75 80

Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Gly Lys Phe
85 90 95

Leu Trp Xaa Trp Ala Ser Ala Arg Phe Ser Trp Leu Ser Leu Leu Val
100 105 110

Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser
115 120 125

Val Met Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Thr Leu
130 135 140

Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr

145 150 155 160

Ile

<210> 30
<211> 305
<212> PRT
<213> HBsAg Trans of TR6

<220>
<221> misc_feature
<222> (168)..(168)
<223> X = any amino acid

<400> 30

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

Leu Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe
20 25 30

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

Gly Gly Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser
50 55 60

Pro Ile Ser Ser Ile Phe Ser Arg Ile Gly Asp Leu Ala Leu Asn Met
65 70 75 80

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

Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp
100 105 110

Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Thr Thr Val Cys Leu
115 120 125

Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys
130 135 140

```
Pro Pro Thr Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile
145                 150                 155                 160

Ile Phe Leu Phe Ile Leu Leu Xaa Cys Leu Ile Phe Leu Leu Val Leu
                165                 170                 175

Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly Ser
            180                 185                 190

Ser Thr Thr Ser Ala Gly Pro Cys Arg Thr Cys Thr Thr Thr Ala Gln
        195                 200                 205

Gly Thr Ser Met Tyr Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly
    210                 215                 220

Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Gly Lys Leu
225                 230                 235                 240

Leu Trp Asp Trp Ala Ser Ala Arg Phe Ser Trp Leu Ser Leu Leu Val
                245                 250                 255

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

Val Met Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Thr Leu
        275                 280                 285

Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr
    290                 295                 300

Ile
305
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<210> 31
<211> 945
<212> DNA
<213> pre ETV

<400> 31
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gtaaaccctg ttccgactac tgcctctcac atatcgtcaa tcttctcgag gattggggac 120

cctgcgctga atatggagaa catcacatca ggattcctag gacccttct cgtgttacag 180

gcggggtttt tcttgttgac aagaatcctc acaataccgm agagtctaga ctcgtggtgg 240

acttctctca attttctagg gggaaccacc gtgtgtcttg gccaaaattc gcagtcccca 300

acctccaatc actcaccaac ctcctgtcct ccgacttgac ctggttatcg ctggatgtgt 360

ctgcggcgtt ttatcatatt cctcttcatc ctgctgctat gcctcatctt cttgttggtt 420

cttctggact atcaaggtat gttgcccgtt tgtcctctaa ttccaggatc ctcaaccacc 480

agcacgggaa catgccgaac ttgcacgact cctgctcaag gaacctctat gtatccctcc 540

tgttgctgta ccaaaccttc ggacggaaat tgcacctgta ttcccatccc atcatcctgg 600

gctttcggaa aattcctatg ggagtgggcc tcagcccgtt tctcatggct cagtttasta 660

gtgccatttg ttcagtggtt cgtagggctt tcccccactg tttggctttc agttatgtgg 720

atgatgtggt attgggggcc aagtctgtac agcatcttga gtccctttt accgctgtta 780

ccaattttct tttgtctctg ggtatacatt tgaaccctaa caaaacaaag agatggggtt 840

actccctaaa ttttatgggc tatgtcattg gatgttatgg gtccttgcca caagaacaca 900

tcgtacataa aatcaaagaa tgttttagaa aacttcctgt taaca 945

<210> 32
<211> 1245
<212> DNA
<213> on ETV

<400> 32
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caaacaccgc aaatccagat tgggacttca atcccaacaa ggacacctgg ccagacgcca 180

acaaggtagg agctggagca ttcgggctgg gtttcacccc accgcacgga ggccttttgg 240

ggtggagccc tcaggctcag ggcatactac aaactttgcc agcaaagccg cctcctgcct 300

ccaccaatcg ccagtcagga cggcagccta ccccgctgtc tccacctttg agagacactc 360

atcctcaggc gcagtggaaa cccacaacct tccaccaaac tgtgcaagct ccacctgctg 420

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tcttctcgag gattggggac cctgcgctga atatggagaa catcacatca ggattcctag 540

gacccttct cgtgttacag gcggggtttt tcttgttgac aagaatcctc acaataccga 600

agagtctaga ctcgtggtgg acttctctca attttctagg gggaaccacc gtgtgtcttg 660

gccaaaattc gcagtcccca acctccaatc actcaccaac ctcctgtcct ccgacttgtc 720

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gcctcatctt cttgttggtt cttctggact atcaaggtat gttgcccgtt tgtcctctaa 840

ttccaggatc ctcaaccacc agcacgggaa catgccgaac ttgcacgact cctgctcaag 900

gaacctctat gtatccctcc tgttgctgta ccaaaccttc ggacggaaat tgcacctgta 960

ttcccatccc atcatcctgg gctttcggaa aattcctatg ggagtgggcc tcagcccgtt 1020

tctcatggct cagtttggta gtgccatttg ttcagtggtt cgtagggctt tcccccactg 1080

tttggctttc atttatgtgg atgatgtggt attgggggcc aagtctgtac agcatcttga 1140

gtccctttt accgctgtta ccaattttct tttgtctctg ggtatacatt tgaaccctaa 1200

caaaacaaag agatggggtt actccctaaa ttttatgggg ctatg 1245

<210> 33
<211> 290
<212> PRT
<213> pre ETV

<220>
<221> misc_feature
<222> (9)..(9)
<223> X = any amino acid

<220>
<221> misc_feature
<222> (73)..(73)
<223> X = any amino acid

<220>
<221> misc_feature
<222> (219)..(219)
<223> X = any amino acid

<400> 33

His Asn Leu Pro Pro Asn Ser Ala Xaa Ser Pro Cys Trp Trp Leu Gln
1 5 10 15

Phe Arg Asn Ser Lys Pro Cys Ser Asp Tyr Cys Leu Ser His Ile Val
20 25 30

Asn Leu Leu Glu Asp Trp Gly Pro Cys Ala Glu Tyr Gly Glu His His
35 40 45

Ile Arg Ile Pro Arg Thr Pro Ser Arg Val Thr Gly Gly Val Phe Leu
50 55 60

Val Asp Lys Asn Pro His Asn Thr Xaa Glu Ser Arg Leu Val Val Asp
65 70 75 80

Phe Ser Gln Phe Ser Arg Gly Asn His Arg Val Ser Trp Pro Lys Phe
85 90 95

Ala Val Pro Asn Leu Gln Ser Leu Thr Asn Leu Leu Ser Ser Asp Leu
100 105 110

Thr Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr His Ile Pro Leu
115 120 125

His Pro Ala Ala Met Pro His Leu Leu Val Gly Ser Ser Gly Leu Ser
130 135 140

Arg Tyr Val Ala Arg Leu Ser Ser Asn Ser Arg Ile Leu Asn His Gln
145 150 155 160

His Gly Asn Met Pro Asn Leu His Asp Ser Cys Ser Arg Asn Leu Tyr
165 170 175

Val Ser Leu Leu Leu Leu Tyr Gln Thr Phe Gly Arg Lys Leu His Leu
180 185 190

Tyr Ser His Pro Ile Ile Leu Gly Phe Arg Lys Ile Pro Met Gly Val
195 200 205

Gly Leu Ser Pro Phe Leu Met Ala Gln Phe Xaa Ser Ala Ile Cys Ser
210 215 220

Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Val Asp
225 230 235 240

Asp Val Val Leu Gly Ala Lys Ser Val Gln His Leu Glu Ser Leu Phe
245 250 255

Thr Ala Val Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro
260 265 270

Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met Gly Tyr Val
275 280 285

Ile Gly
290

<210> 34
<211> 251
<212> PRT
<213> on ETV

<400> 34

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

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

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

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

Asn Leu Gln Ser Leu Thr Asn Leu Leu Ser Ser Asp 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 Leu Asn His Gln His Gly Asn
115 120 125

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

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Leu Leu Leu Tyr Gln 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 Met Ala Gln Phe Gly Ser Ala Ile Cys Ser Val Val Arg
            180                 185                 190

Arg Ala Phe Pro His Cys Leu Ala Phe Ile Tyr Val 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
                245                 250
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<210> 35
<211> 110
<212> PRT
<213> pre ETV

<220>
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<222> (8)..(8)
<223> X = any amino acid

<220>
<221> misc_feature
<222> (72)..(72)
<223> X = any amino acid

<400> 35

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Thr Phe His Gln Thr Leu Gln Xaa Pro Pro Ala Gly Gly Ser Ser Ser
1               5                   10                  15

Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser His Ile Ser Ser Ile
            20                  25                  30
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Phe Ser Arg Ile Gly Asp Pro Ala Leu Asn Met Glu Asn Ile Thr Ser
35 40 45

Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu
50 55 60

Thr Arg Ile Leu Thr Ile Pro Xaa Ser Leu Asp Ser Trp Trp Thr Ser
65 70 75 80

Leu Asn Phe Leu Gly Gly Thr Thr Val Cys Leu Gly Gln Asn Ser Gln
85 90 95

Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro Pro Thr
100 105 110

<210> 36
<211> 226
<212> PRT
<213> post ETV

<400> 36

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 Lys 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 Thr Cys Arg Thr Cys Thr Thr Pro 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 Val
                165                 170                 175

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

Ser Phe Met 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
```