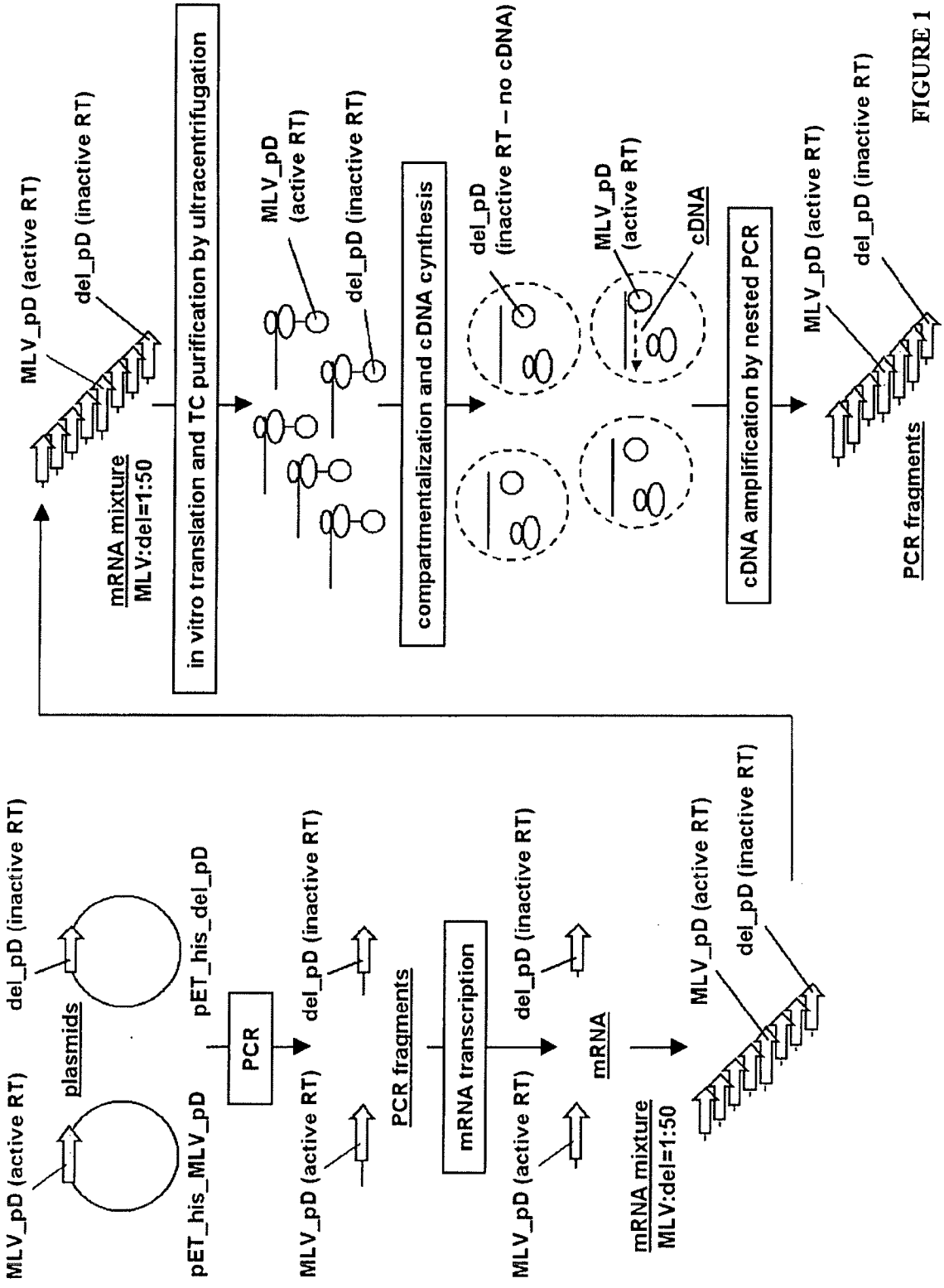

MLV_pD (active RT)
del_pD (inactive RT)
plasmids
pET_his_MLV_pD
pET_his_del_pD
PCR
MLV_pD (active RT)
del_pD (inactive RT)
PCR fragments
mRNA transcription
MLV_pD (active RT)
del_pD (inactive RT)
mRNA
mRNA mixture
MLV:del=1:50
MLV_pD (active RT)
del_pD (inactive RT)
in vitro translation and TC purification by ultracentrifugation
MLV_pD (active RT)
del_pD (inactive RT)
compartmentalization and cDNA cynthesis
del_pD (inactive RT – no cDNA)
MLV_pD (active RT)
cDNA
cDNA amplification by nested PCR
MLV_pD (active RT)
del_pD (inactive RT)
PCR fragments

FIGURE 1

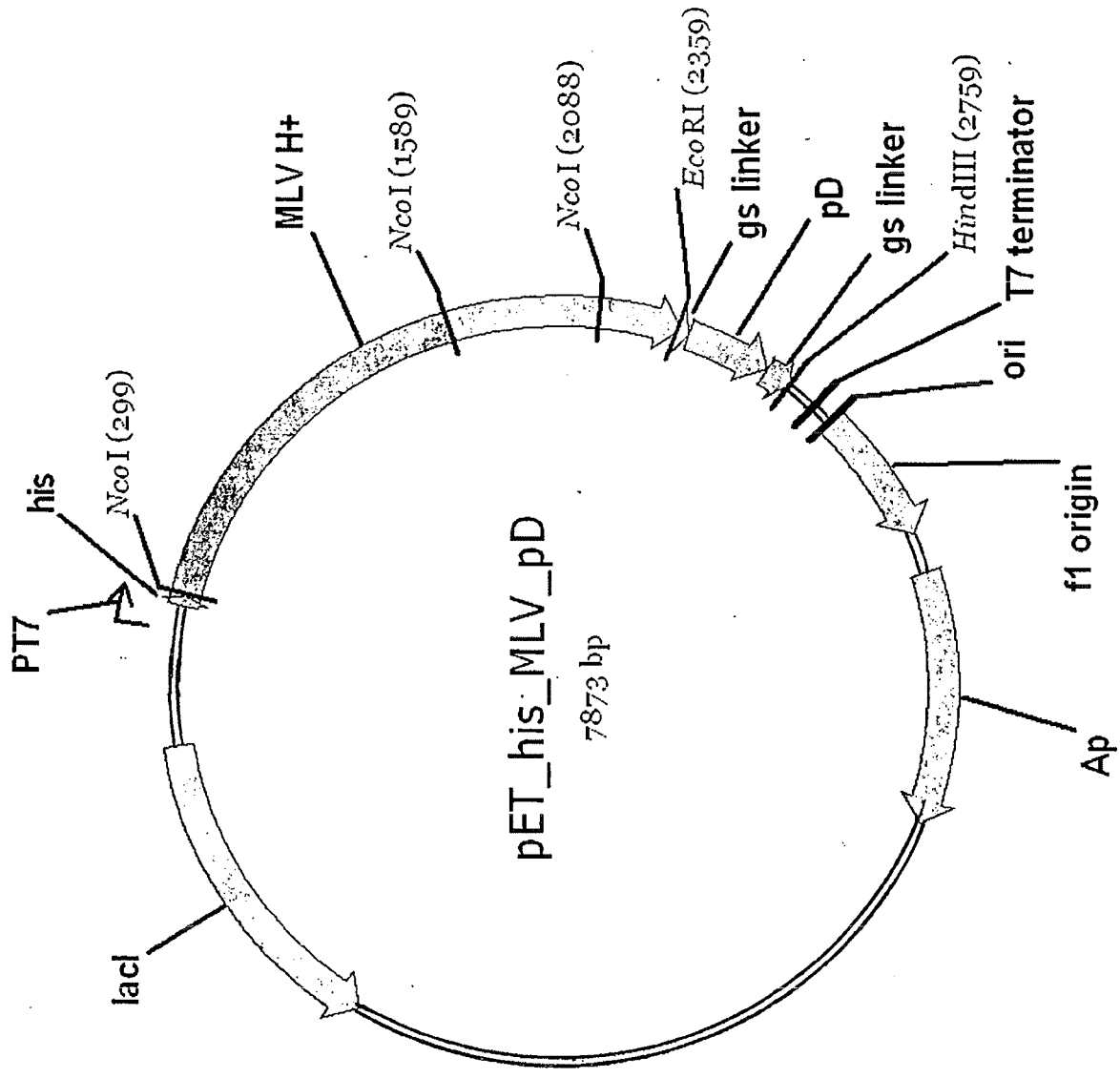

pET_his_MLV_pD
7873 bp
PT7
his
NcoI (299)
MLV H+
NcoI (1589)
NcoI (2088)
EcoRI (2359)
gs linker
pD
gs linker
HindIII (2759)
T7 terminator
ori
f1 origin
Ap
lacI

FIGURE 2

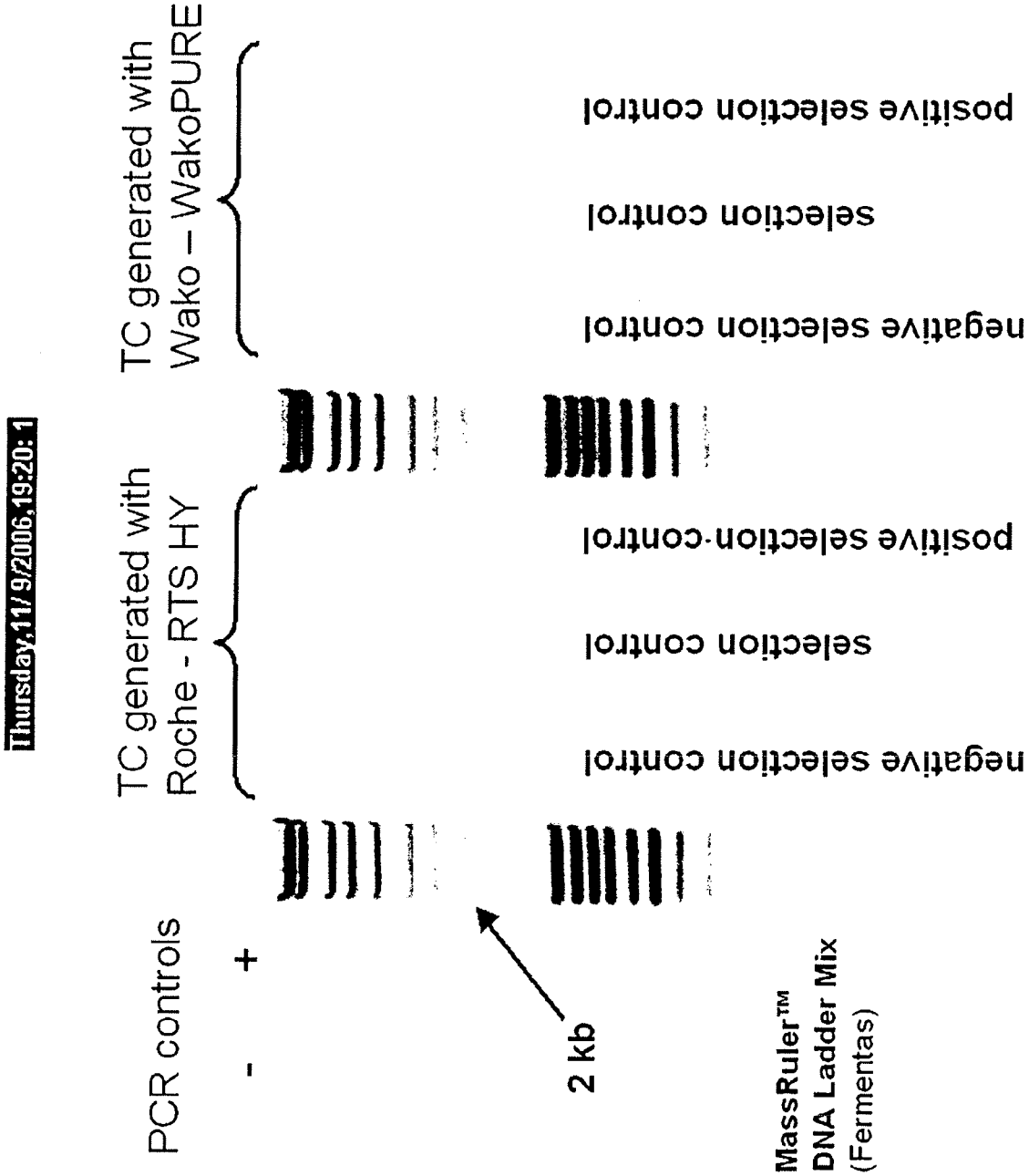

Thursday, 11/9/2006, 19:20: 1
PCR controls
+
-
TC generated with
Roche - RTS HY
TC generated with
Wako – WakoPURE
2 kb
MassRuler™
DNA Ladder Mix
(Fermentas)
negative selection control
selection control
positive selection control
negative selection control
selection control
positive selection control

FIGURE 3

FIGURE 4

Thursday, 11/ 9/2006, 13:25:53

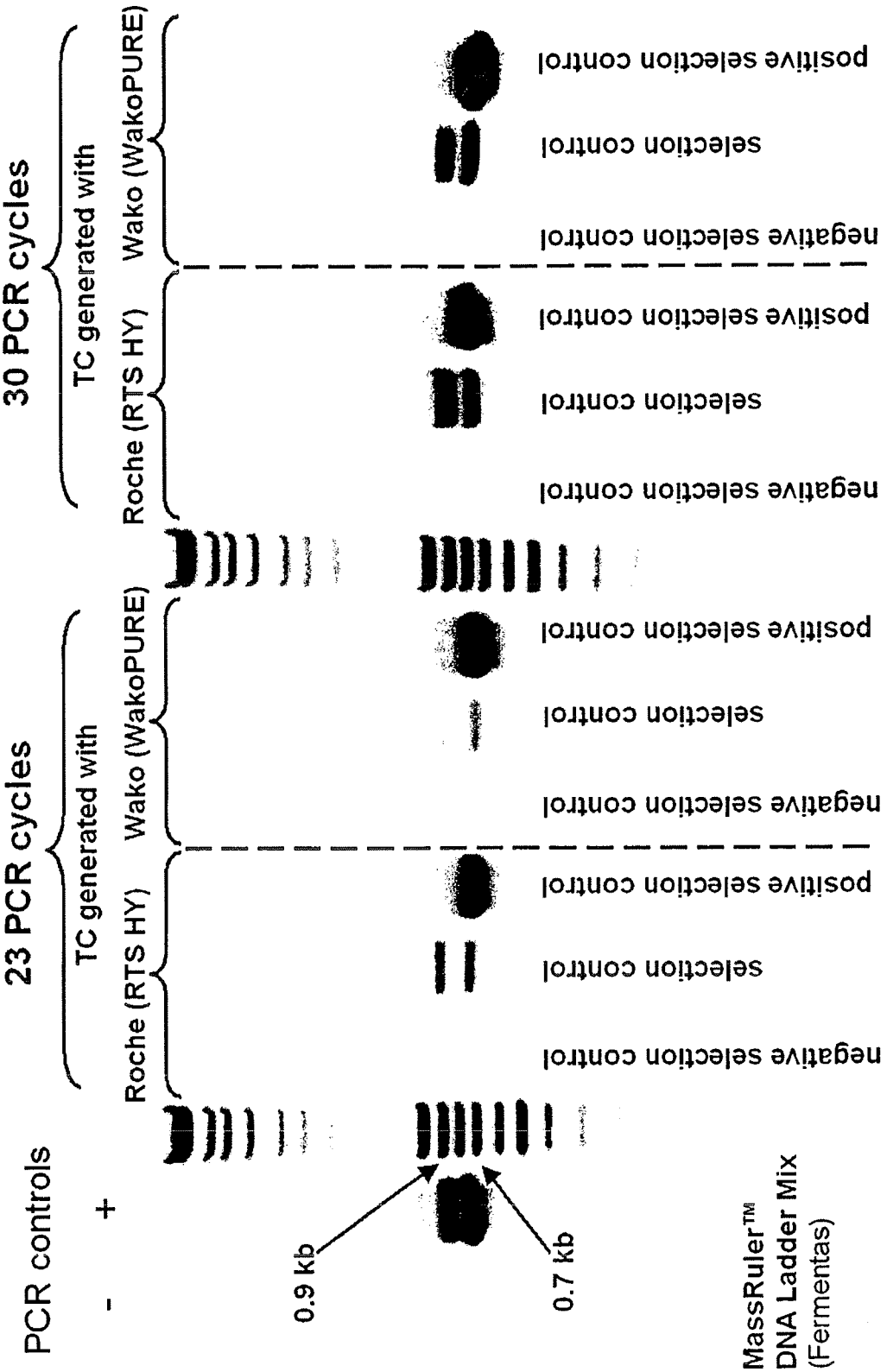
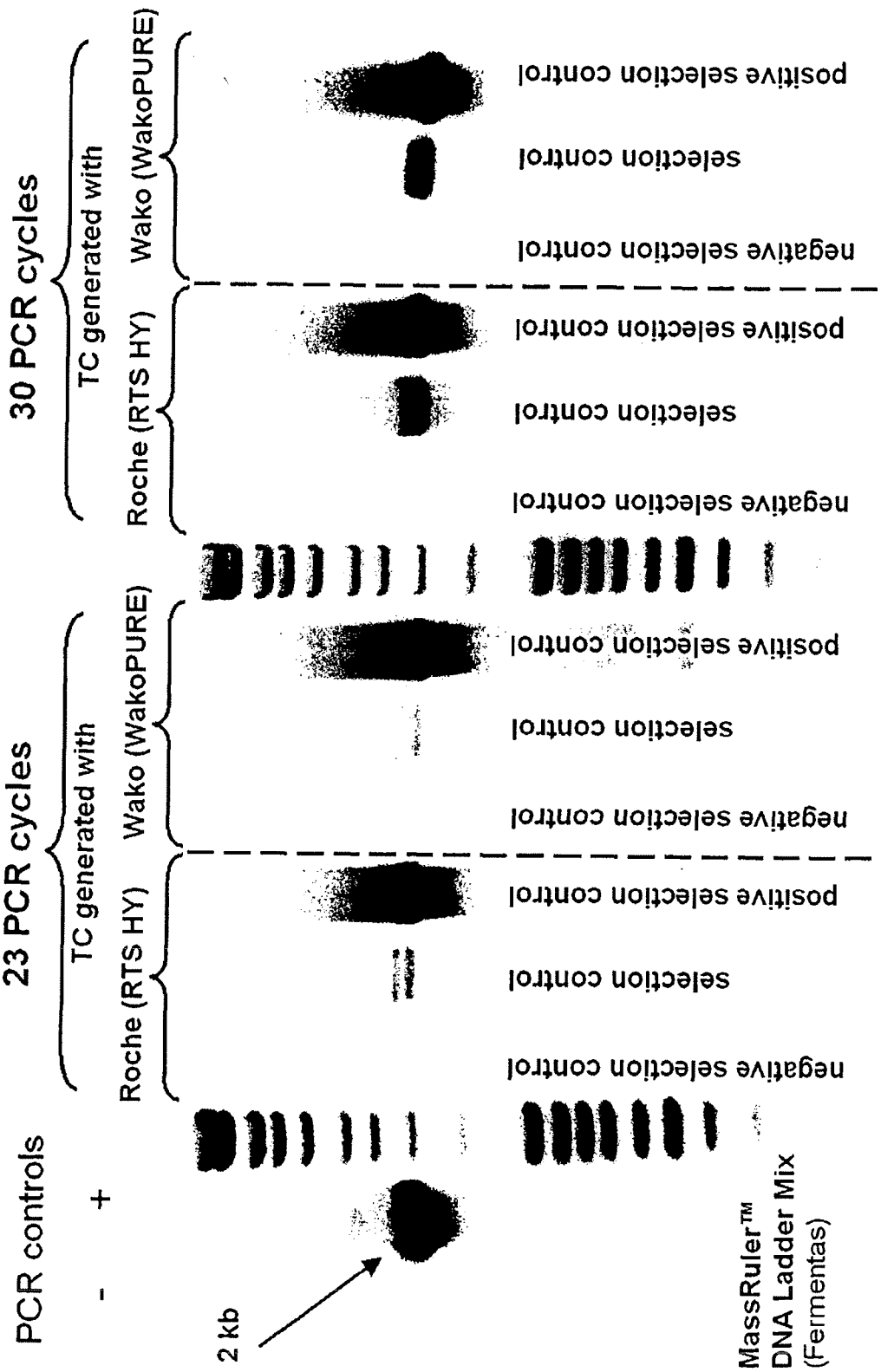


FIGURE 5

Thursday, 11/ 9/2006, 16:11:16



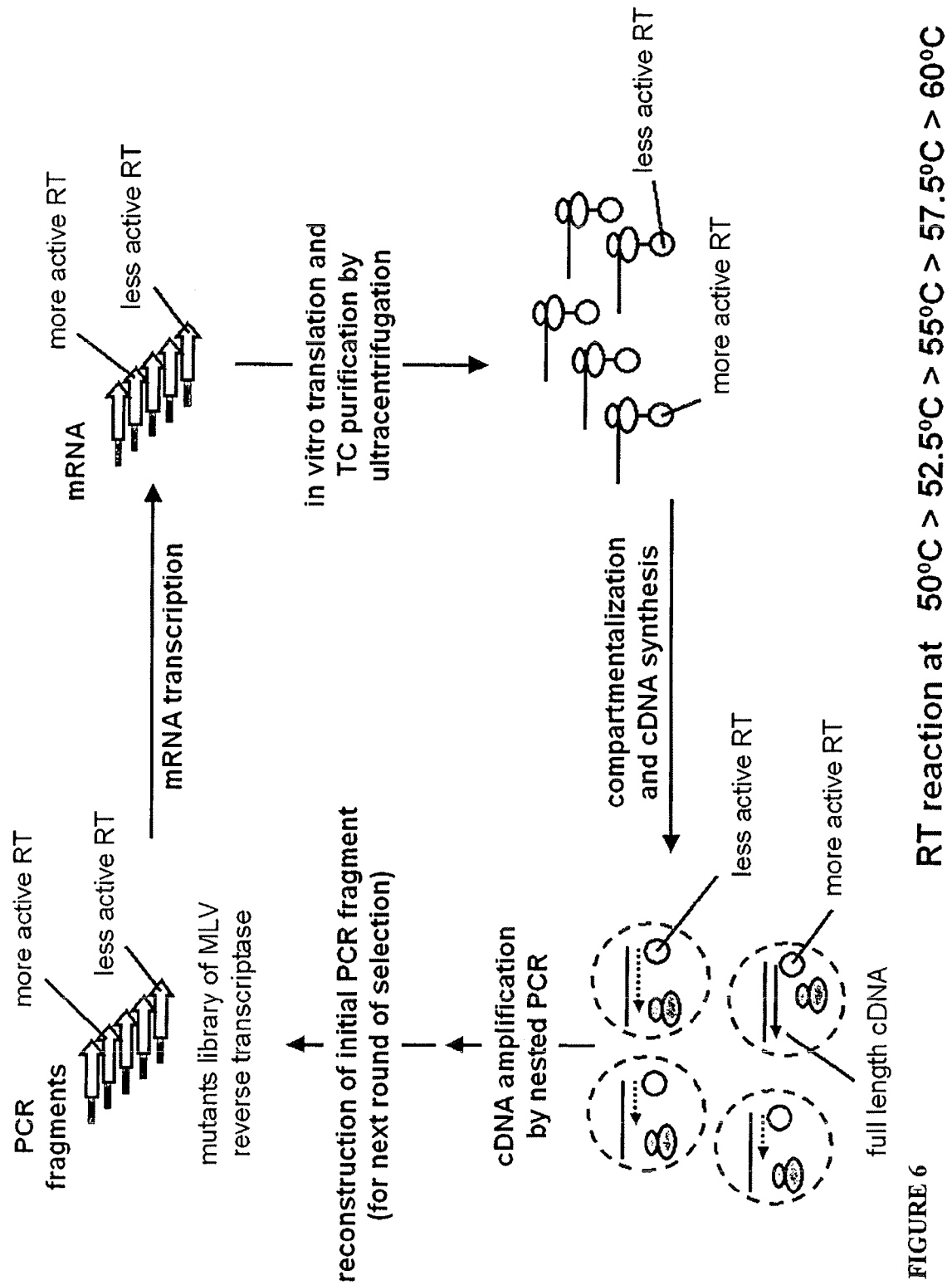

PCR fragments
more active RT
less active RT
mutants library of MLV reverse transcriptase
mRNA transcription
mRNA
more active RT
less active RT
in vitro translation and TC purification by ultracentrifugation
reconstruction of initial PCR fragment (for next round of selection)
cDNA amplification by nested PCR
compartmentalization and cDNA synthesis
less active RT
more active RT
less active RT
more active RT
full length cDNA
RT reaction at 50°C > 52.5°C > 55°C > 57.5°C > 60°C

FIGURE 6

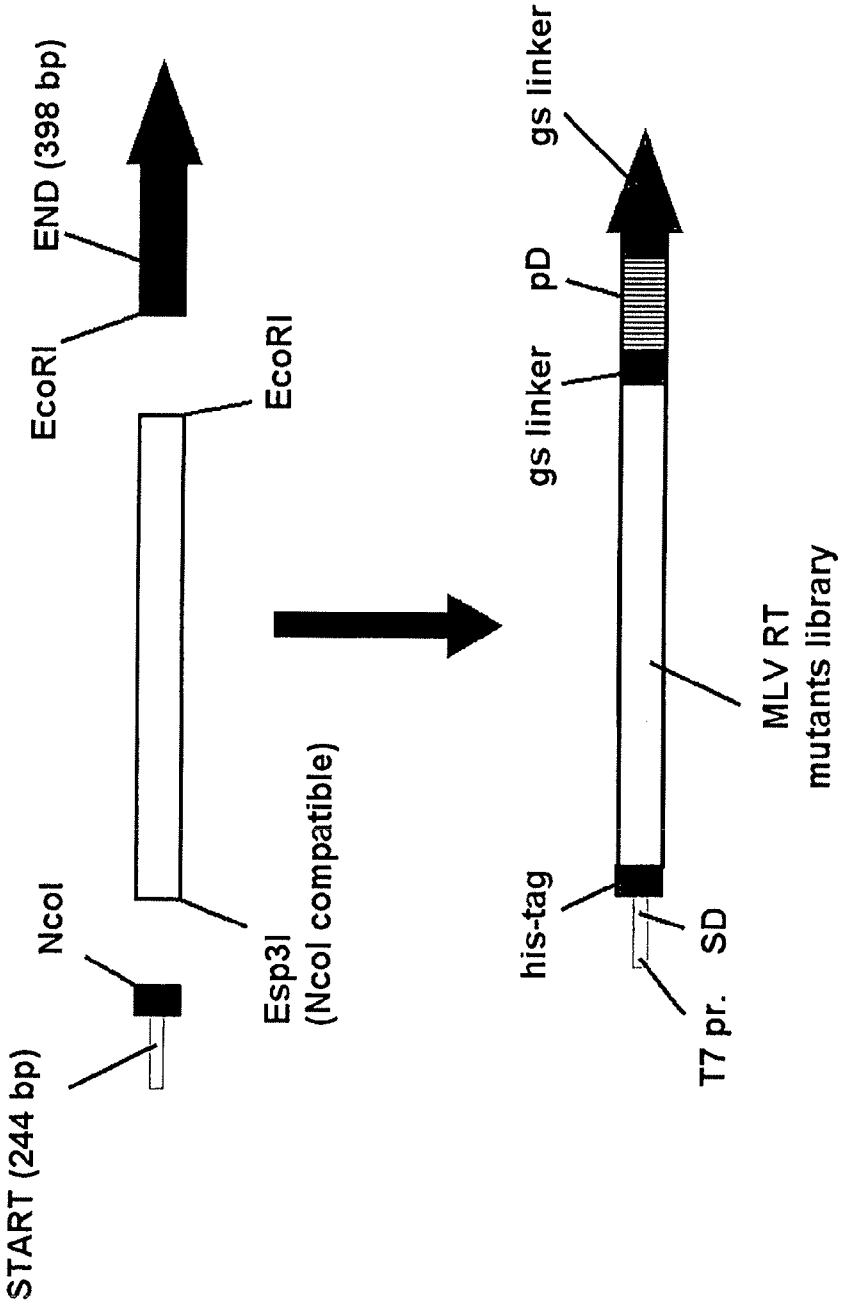

START (244 bp)
NcoI
Esp3I
(NcoI compatible)
EcoRI
EcoRI
END (398 bp)
his-tag
T7 pr.
SD
MLV RT
mutants library
gs linker
pD
gs linker
gs linker

FIGURE 7

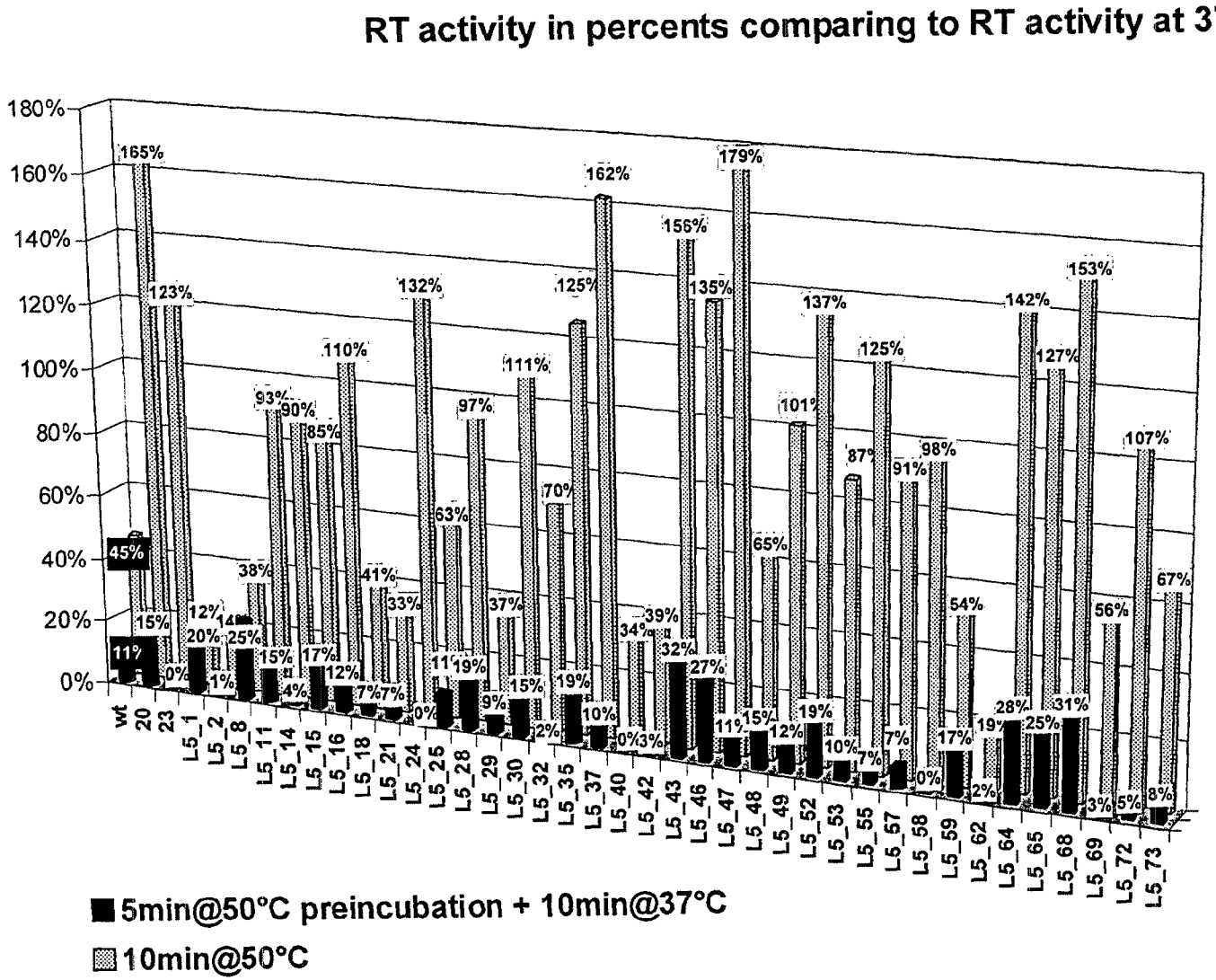

RT activity in percents comparing to RT activity at 37°C
180%
160%
140%
120%
100%
80%
60%
40%
20%
0%
wt
20
23
L5_1
L5_2
L5_8
L5_11
L5_14
L5_15
L5_16
L5_18
L5_21
L5_24
L5_25
L5_28
L5_29
L5_30
L5_32
L5_35
L5_37
L5_40
L5_42
L5_43
L5_46
L5_47
L5_48
L5_49
L5_52
L5_53
L5_55
L5_57
L5_58
L5_59
L5_62
L5_64
L5_65
L5_68
L5_69
L5_72
L5_73
5min@50°C preincubation + 10min@37°C
10min@50°C

FIGURE 8

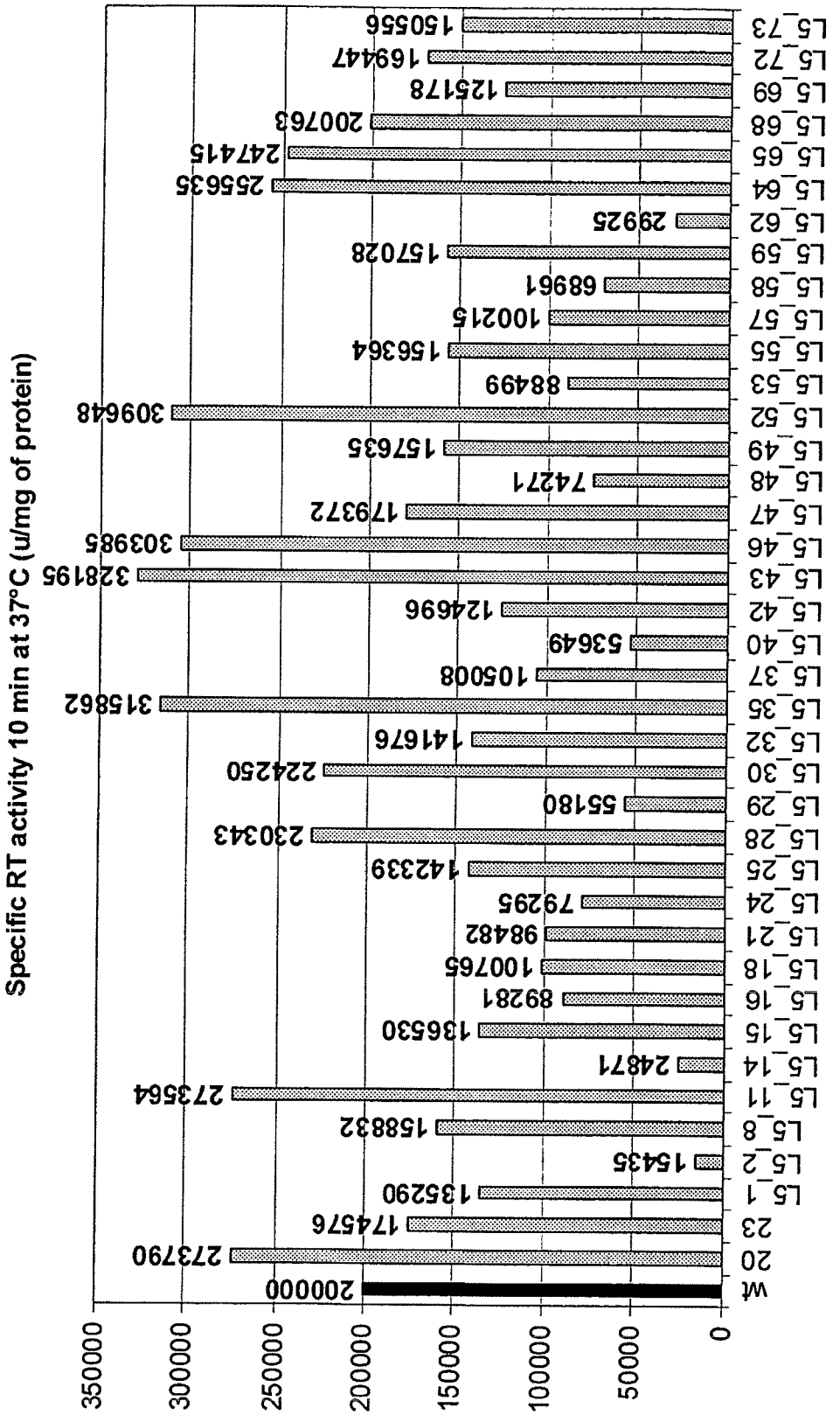

Specific RT activity 10 min at 37°C (u/mg of protein)
350000
300000
250000
200000
150000
100000
50000
0
wt
20
23
L5_1
L5_2
L5_8
L5_11
L5_14
L5_15
L5_16
L5_18
L5_21
L5_24
L5_25
L5_28
L5_29
L5_30
L5_32
L5_35
L5_37
L5_40
L5_42
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L5_52
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L5_57
L5_58
L5_59
L5_62
L5_64
L5_65
L5_68
L5_69
L5_72
L5_73
200000
273790
174576
135290
15435
158832
273564
24871
136530
89281
100765
98482
79295
142339
230343
55180
224250
141676
315862
105008
53649
124696
328195
303985
179372
74271
157635
309648
84499
156364
100215
68961
157028
29925
255635
247415
200763
125178
169447
150556

FIGURE 9

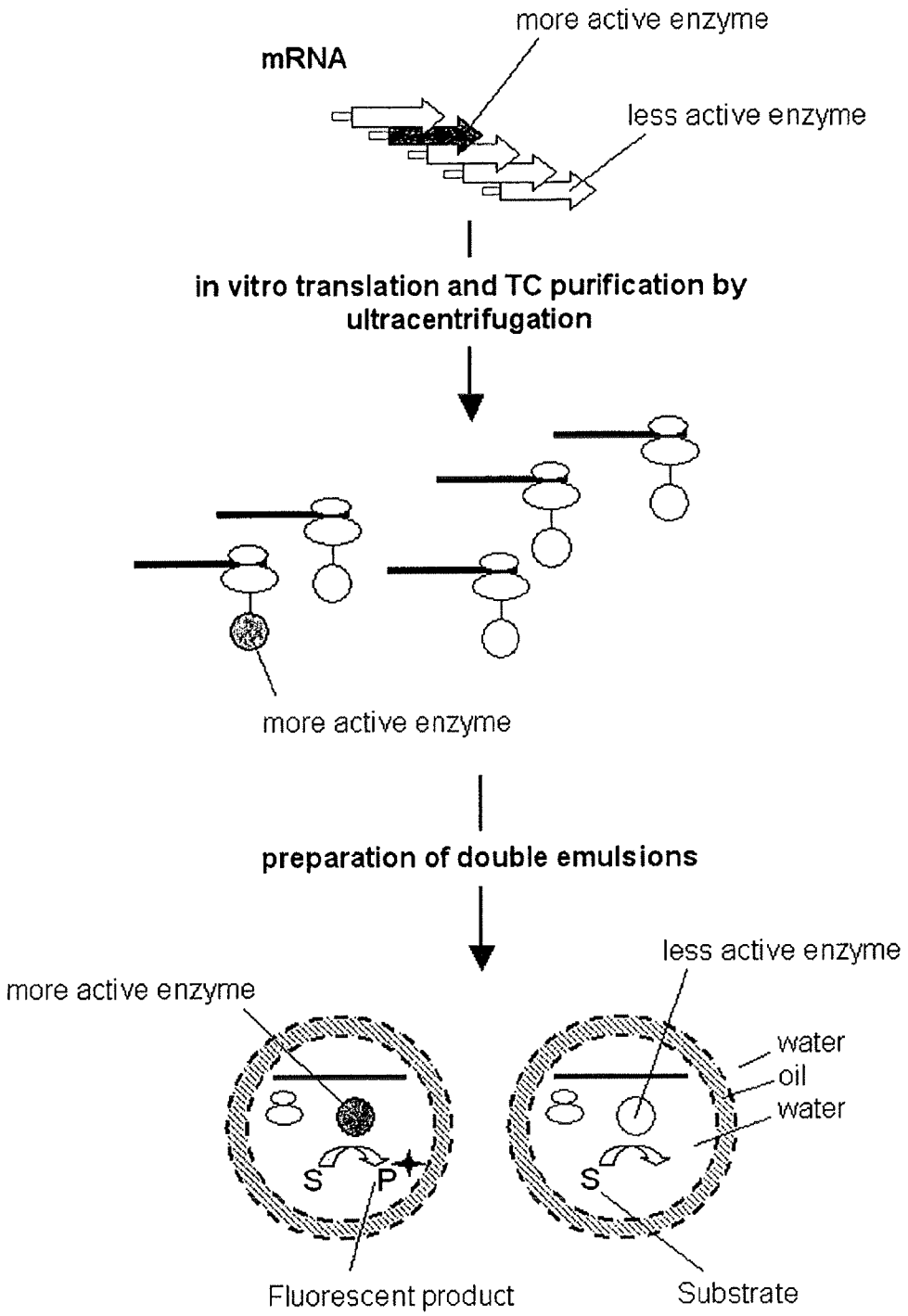

more active enzyme
mRNA
less active enzyme
in vitro translation and TC purification by ultracentrifugation
more active enzyme
preparation of double emulsions
less active enzyme
more active enzyme
water
oil
water
S
P
S
Fluorescent product
Substrate
Sorting in FACS

FIGURE 10

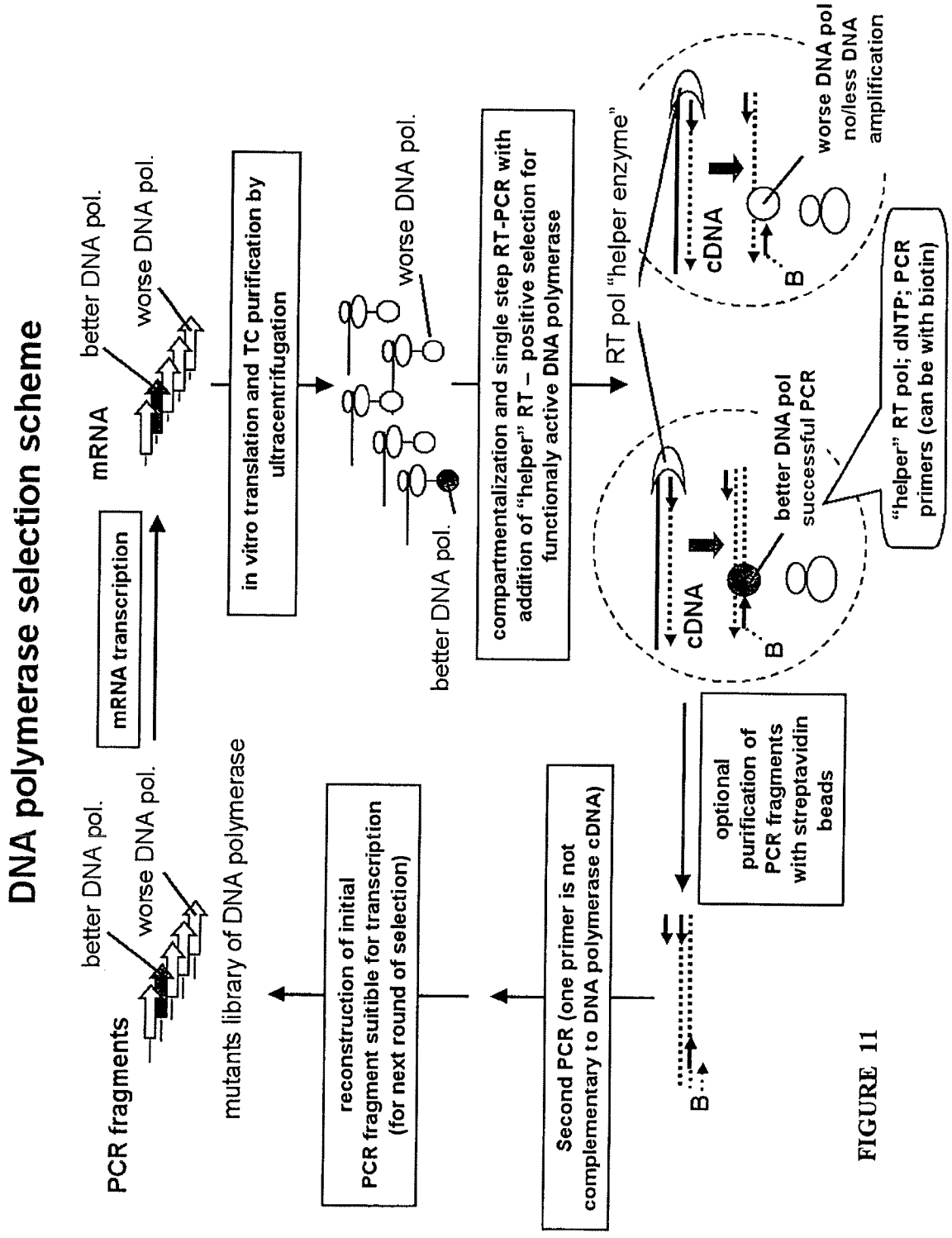

DNA polymerase selection scheme
PCR fragments
better DNA pol.
worse DNA pol.
mutants library of DNA polymerase
reconstruction of initial PCR fragment suitible for transcription (for next round of selection)
Second PCR (one primer is not complementary to DNA polymerase cDNA)
B
optional purification of PCR fragments with streptavidin beads
mRNA
mRNA transcription
in vitro translation and TC purification by ultracentrifugation
compartmentalization and single step RT-PCR with addition of "helper" RT – positive selection for functionaly active DNA polymerase
RT pol "helper enzyme"
cDNA
better DNA pol successful PCR
worse DNA pol no/less DNA amplification
"helper" RT pol; dNTP; PCR primers (can be with biotin)

FIGURE 11

DNA dependent DNA polymerase evolution scheme

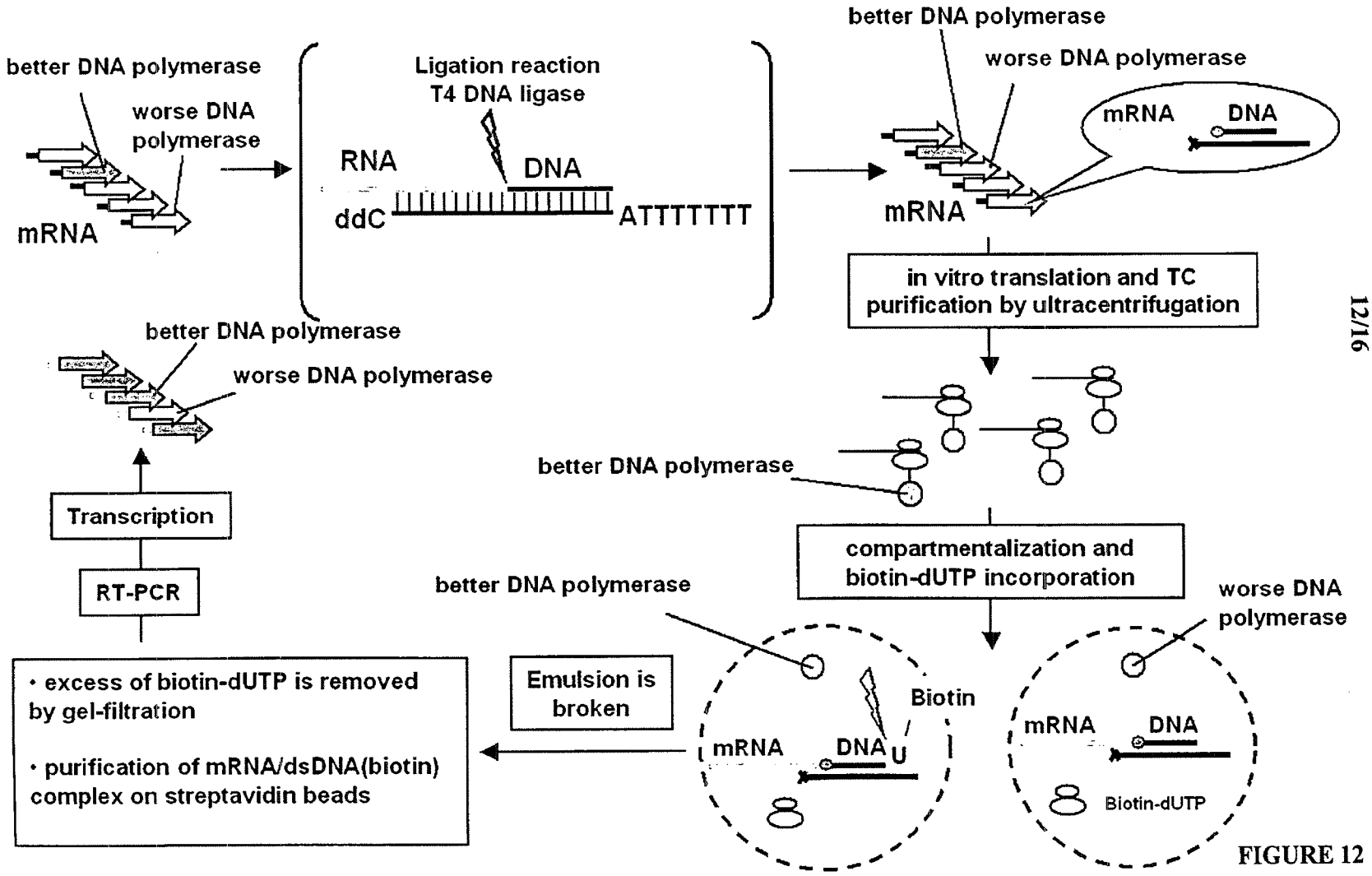


FIGURE 12

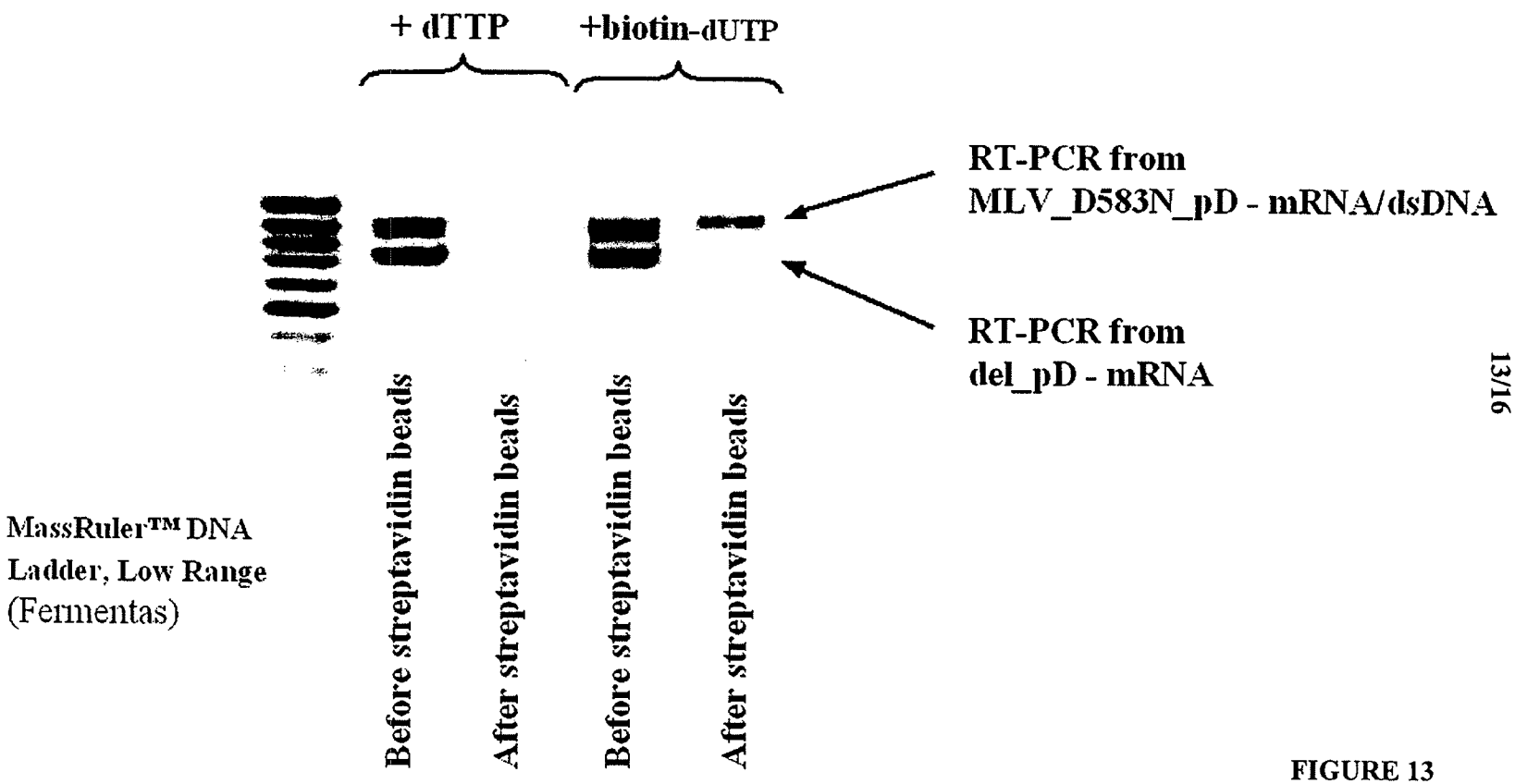
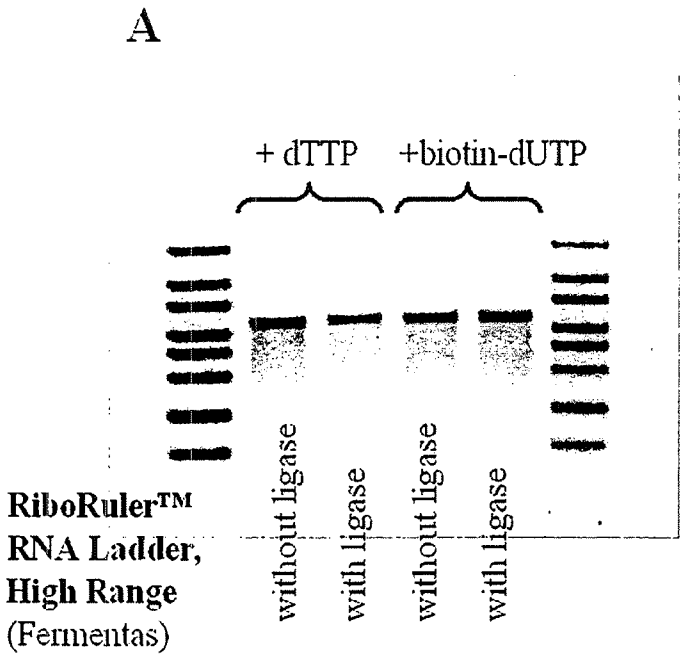
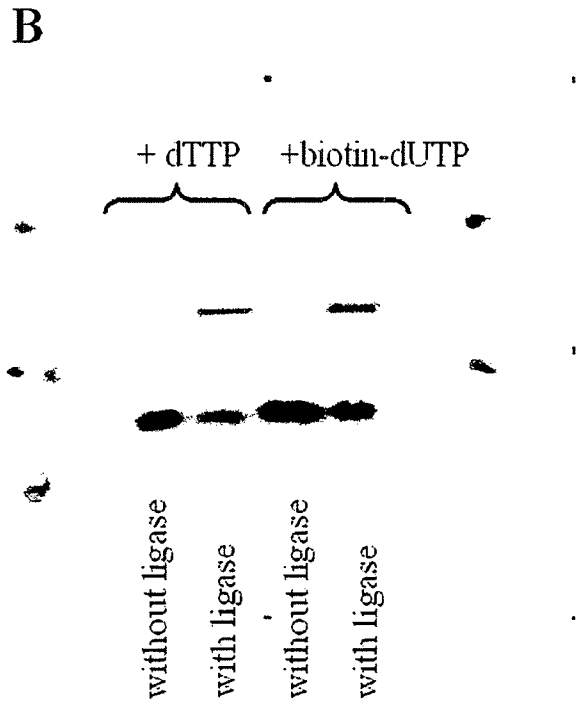

+ dTTP
+biotin-dUTP
RT-PCR from
MLV_D583N_pD - mRNA/dsDNA
RT-PCR from
del_pD - mRNA
MassRuler™ DNA
Ladder, Low Range
(Fermentas)
Before streptavidin beads
After streptavidin beads
Before streptavidin beads
After streptavidin beads

FIGURE 13





C

long+

5′-.....mRNA.....CGAACGTGGCGAGAAAGGAAGGGAAGAAAGAAGTC +dTTP(biotin-dUTP)+[α-P^{33}]dATP

ddC-GCCTTGGCCGCCACCTAGCACAGAAGAAGCTTGCACCGCTCTTTCCTTCCCTTCTTTCTTCAGATTTTTTT-5′

ddC-Long2

FIGURE 14

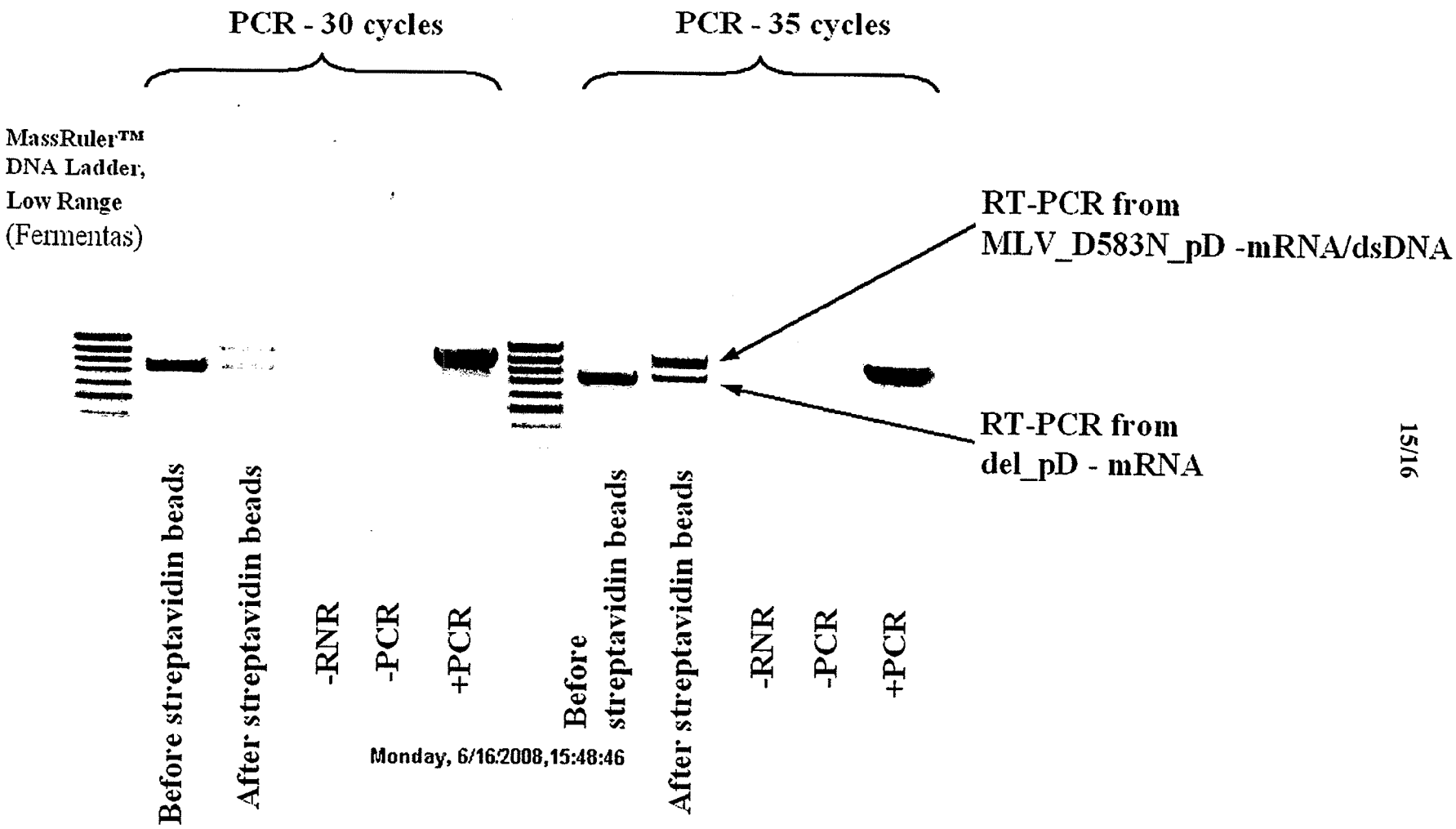

PCR - 30 cycles
PCR - 35 cycles
MassRuler™ DNA Ladder, Low Range (Fermentas)
RT-PCR from MLV_D583N_pD -mRNA/dsDNA
RT-PCR from del_pD - mRNA
Before streptavidin beads
After streptavidin beads
-RNR
-PCR
+PCR
Before streptavidin beads
After streptavidin beads
-RNR
-PCR
+PCR
Monday, 6/16/2008, 15:48:46

FIGURE 15

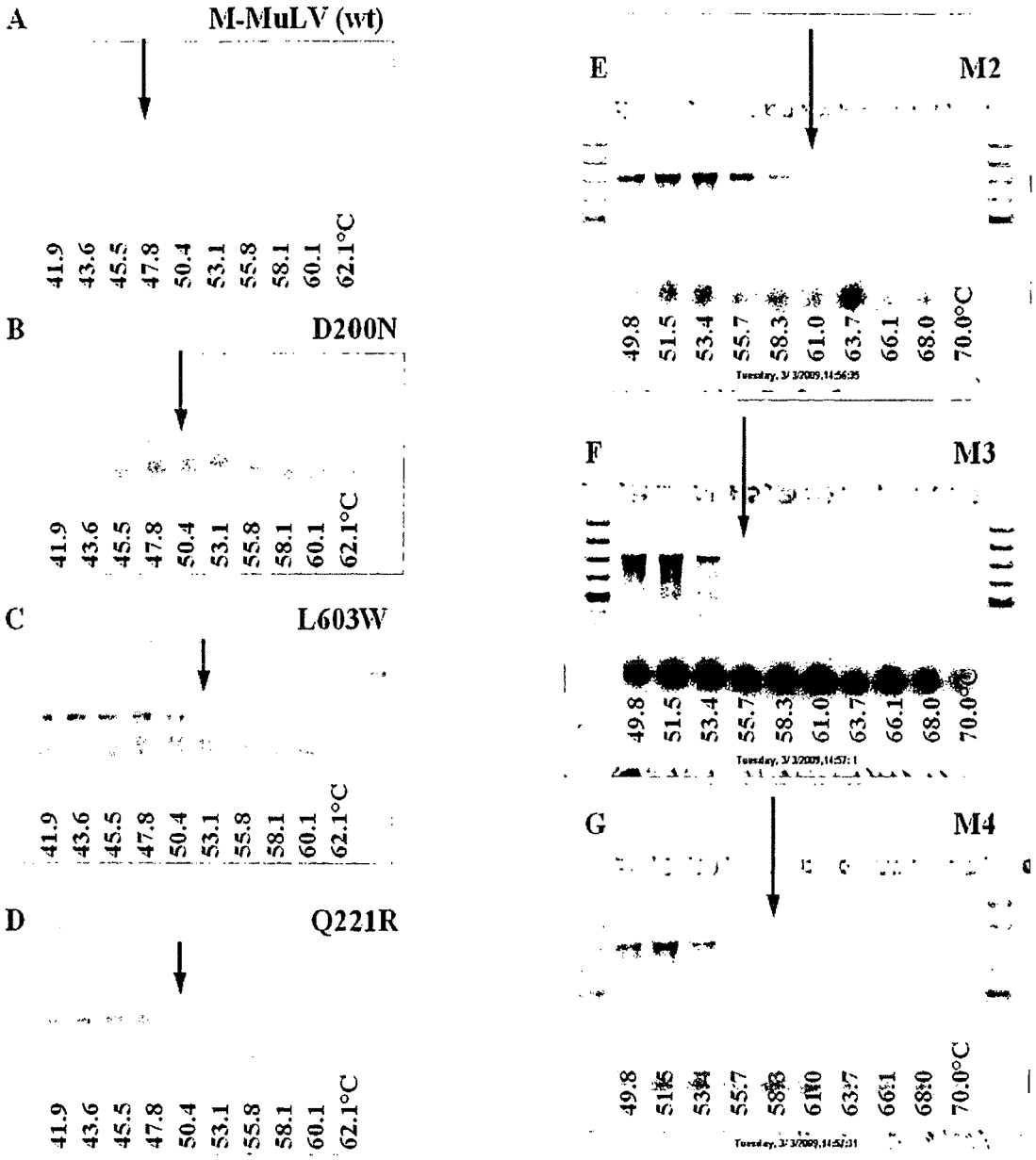

A
M-MuLV (wt)
41.9
43.6
45.5
47.8
50.4
53.1
55.8
58.1
60.1
62.1°C
B
D200N
C
L603W
D
Q221R
E
M2
49.8
51.5
53.4
55.7
58.3
61.0
63.7
66.1
68.0
70.0°C
F
M3
G
M4

FIGURE 16

SEQUENCE LISTING

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<120> Production of nucleic acid

<130> 316023.WO/JND/CJS

<140> PCT/EP2009/054329
<141> 2009-04-09

<160> 128

<170> PatentIn version 3.3

<210> 1
<211> 7873
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pET-his-MLV-pD

<400> 1
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ccgatcttcc ccatcggtga tgtcggcgat ataggcgcca gcaaccgcac ctgtggcgcc 120

ggtgatgccg gccacgatgc gtccggcgta gaggatcgag atctatacga aattaatacg 180

actcactata gggagaccac aacggtttcc ctctagaaat aattttgttt aactttaaga 240

aagaggagaa attacatatg agaggatcgc atcaccatca ccatcacgga tctggttcca 300

tgggcatgac cctaaatata gaagatgagc atcggctaca tgagacctca aaagagccag 360

atgtttctct agggtccaca tggctgtctg attttcctca ggcctgggcg gaaaccgggg 420

gcatgggact ggcagttcgc caagctcctc tgatcatacc tctgaaagca acctctaccc 480

ccgtgtccat aaaacaatac cccatgtcac aagaagccag actggggatc aagccccaca 540

tacagagact gttggaccag ggaatactgg taccctgcca gtccccctgg aacacgcccc 600

tgctacccgt taagaaacca gggactaatg attataggcc tgtccaggat ctgagagaag 660

tcaacaagcg ggtggaagac atccacccca ccgtgcccaa cccttacaac ctcttgagcg 720

ggctcccacc gtcccaccag tggtacactg tgcttgattt aaaggatgcc tttttctgcc 780

tgagactcca ccccaccagt cagcctctct tcgcctttga gtggagagat ccagagatgg 840

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gatggctgac tgaggccaga aaagagactg tgatggggca gcctactccg aagacccctc 1200

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tgaccgctac acttgccagc gccctagcgc ccgctccttt cgctttcttc ccttcctttc 3060

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Leu Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln
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Tyr Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln
                85                  90                  95

Arg Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn
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Thr Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro
        115                 120                 125

Val Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro
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Thr Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His
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Phe Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu
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Ala Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr
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Ser Ser Arg Lys Leu Val Ala Trp Asp Gly Thr Thr Asp Gly Ala Ala
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Phe Tyr Lys Ser Gly Thr Phe Arg Tyr Glu Asp Val Leu Trp Pro Glu
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Glu Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln
        35                  40                  45

Ala Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro
    50                  55                  60

Leu Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln
65                  70                  75                  80

Tyr Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln
                85                  90                  95

Arg Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn
            100                 105                 110

Thr Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro
        115                 120                 125

Val Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro
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Thr Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His
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Gln Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg
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Ala Tyr Leu Ser Lys Lys Leu Asp Pro Val Ala Ala Gly Trp Pro Pro
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Cys Leu Arg Met Val Ala Ala Ile Ala Val Leu Thr Lys Asp Ala Gly
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Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
```

325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

```
Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 26
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 26

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Val Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285
```

```
Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Ala Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile Arg Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
```

625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 27
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 27

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Arg Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala

245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Leu Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

```
Ile His Gly Glu Ile Tyr Arg Arg Arg Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 28
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 28

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205
```

```
Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Asp Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Val Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
```

545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asn Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 29
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 29

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu

165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu Arg Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Ala Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

```
Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Ile Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680


<210>  30
<211>  683
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Mutant MLV reverse transcriptase

<400>  30

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Ser Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125
```

```
Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Ala Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
```

465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Phe Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Lys Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Asp Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 31
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 31

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

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

85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

```
Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Thr Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680

<210>  32
<211>  683
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Mutant MLV reverse transcriptase

<400>  32

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Leu Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45
```

```
Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Met Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Trp Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
```

385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Ala Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 33
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 33

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu

```
1               5                  10                  15

Pro Asp Val Ser Leu Gly Pro Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Ala Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Arg Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350
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```
Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Val Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 34

<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 34

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Ser Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Trp Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Pro Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
```

```
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Leu Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Trp
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655
```

```
Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 35
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 35

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Gln Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Thr Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270
```

```
Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys His Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Ile
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
```

610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Thr
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 36
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 36

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Val Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Ser Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr

225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Arg Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Ala Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Val His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

```
Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 37
<211> 680
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 37

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asn Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190
```

```
Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asp Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
```

530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Gln Leu Asn Val Tyr Thr Gly Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Val Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Ile Pro Ala
675 680

<210> 38
<211> 680
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 38

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu

```
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495
```

```
Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Ile Pro Ala
        675                 680
```

<210> 39
<211> 680
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 39

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110
```

```
Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Ser Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Thr Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu Arg Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Leu Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Ala Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
```

```
450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Ala Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Ile Pro Ala
        675                 680


<210>  40
<211>  683
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Mutant MLV reverse transcriptase

<400>  40

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
```

```
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Arg Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Ile Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415
```

```
Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Ala Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Val Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Val Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 41
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 41

```
Thr Leu Asn Ile Glu Asp Glu Arg Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30
```

```
Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
```

370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

Phe Leu Pro Lys Arg Leu Ser Thr Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Val Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 42
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 42

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Met Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335
```

```
Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asn Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Gly Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
```

675 680

<210> 43
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 43

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asp Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu

```
290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Arg Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Ala Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Val His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640
```

```
Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 44
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 44

```
Thr Leu Asn Ile Lys Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Ile Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Ala Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255
```

```
Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Leu Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Lys Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
```

595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 45
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 45

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Val His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Arg Leu Pro Pro Ser Arg Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp

```
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Ala Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Pro Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560
```

```
Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Arg Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Gln Ala Ala Ile Thr Glu Thr Pro Asp Thr Pro Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 46
<211> 680
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 46

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175
```

```
Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Val
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Gly Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
```

515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Ala
675 680

<210> 47
<211> 680
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 47

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln

```
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Ala Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480
```

```
Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Ala Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile Arg Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Pro
        675                 680


<210>  48
<211>  680
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Mutant MLV reverse transcriptase

<400>  48

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95
```

```
Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
```

435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Gly Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Pro Ala
675 680

<210> 49
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 49

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr

```
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asn Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Pro Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Ser Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln Arg Pro Asp Leu Ile Leu Leu Gln Cys Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Ala Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala His Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400
```

```
Pro Val Ala Ala Gly Trp Leu Pro Cys Leu Arg Met Val Ala Val Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Thr Pro His Ala Val Glu Ala Leu Ala Lys Gln Leu Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 50
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 50

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Thr Glu
1               5                  10                  15
```

```
Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
```

355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Arg
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Ala Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 51
<211> 683
<212> PRT

<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transriptase

<400> 51

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Ser Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Lys Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Ala Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Arg Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320
```

```
Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Gly Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Glu Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
```

660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 52
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 52

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Trp Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Ala Leu Phe Gly Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val

```
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Ala Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620
```

```
Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 53
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 53

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Ser Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Glu Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240
```

```
Arg Ala Leu Leu Gln Thr Leu Gly Asp Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Val Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala His Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
```

580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Gly Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 54
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 54

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Leu Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala

```
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540
```

```
Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Gly Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Lys Arg Gly Met Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 55
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 55

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160
```

```
His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Thr Thr His Tyr Gln Thr Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Arg Thr Arg Pro Asp Leu Thr Asp Gln
```

500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Arg Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Val Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 56
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 56

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Ala Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Pro Val Pro Cys Gln Ser Pro Trp Ser Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr

115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Ala Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Arg Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Thr Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Glu Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Leu Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

```
Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 57
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 57

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Ser Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80
```

```
Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Lys Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Ser Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
```

420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Pro Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asn Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 58
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 58

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Leu Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu

```
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Met Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380
```

```
Leu Gly Pro Arg Arg Trp Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Pro Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 59
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 59

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Arg Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
```

```
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Ser Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Arg Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 60
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 60

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Leu Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Lys Phe Leu
    290                 295                 300
```

```
Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Glu Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
```

645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 61
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 61

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu

```
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Ala Ala Gly Ser Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Ala Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile Arg Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605
```

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

Ser Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 62
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 62

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Gly Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

```
Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Pro Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Val His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
```

565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 63
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 63

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe

180 185 190

Lys Asn Ser Pro Thr Leu Phe Ala Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Gly Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asp Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

```
Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Pro Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 64
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 64

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Gly Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Pro Leu Ser Gly Pro Pro Pro Ser His Gln
    130                 135                 140
```

```
Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Gln Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
```

485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Gly Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Phe Arg Leu Ile Asn
675 680

<210> 65
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 65

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val

```
          100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445
```

```
Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
     450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asp Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 66
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 66

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60
```

```
Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile Ser Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Phe Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
```

405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Lys Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 67
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 67

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Val Thr Ser Lys Glu
1 5 10 15

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

```
          20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Val Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365
```

```
Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Val Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 68
<211> 680
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 68

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Ala Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Arg Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Ser Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Phe Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
```

325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala Arg Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Gly Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

```
Glu Asn Ser Ser Pro Asn Ser Arg
        675                 680


<210>  69
<211>  683
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Mutant MLV reverse transcriptase

<400>  69

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15


Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30


Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45


Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ala Ile Lys Gln Tyr
    50                  55                  60


Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80


Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95


Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110


Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125


Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
    130                 135                 140


Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160


His Pro Thr Ser Gln Pro Leu Ser Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175


Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190


Lys Asn Ser Pro Thr Leu Tyr Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205


Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220


Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240


Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255


Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270


Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285
```

```
Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Asp Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp His Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Gly Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
```

625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 70
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transriptase

<400> 70

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Leu
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala

245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Pro Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Ala Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

```
Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 71
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 71

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205
```

```
Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Arg Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
```

545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

Ser Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asn Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 72
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 72

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Pro Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu

```
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Arg Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asp Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510
```

```
Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680

<210>  73
<211>  683
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Mutant MLV reverse transcriptase

<400>  73

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125
```

```
Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
```

465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Thr Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 74
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 74

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

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

85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Ser Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile Arg Pro Ala
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

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

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly Tyr Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asn Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 75
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 75

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

```
Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro Arg Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
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385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 76
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 76

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu

```
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Val Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Ser Ser Pro Thr Leu Phe Asp Glu Ala Leu Arg Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Ala Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350
```

```
Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Ala Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 77

<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 77

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Gly Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
```

```
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Gln Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asn Gln Ala Ala
                645                 650                 655
```

```
Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 78
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 78

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270
```

```
Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Arg Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
```

610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 79
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 79

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Ser Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr

```
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Val Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575
```

```
Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile Tyr Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 80
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 80

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Thr Leu Asn Ile Lys Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190
```

```
Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Ala
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
```

530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala His Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Pro Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 81
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 81

Thr Leu Asn Ile Glu Asp Glu Pro Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu

145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Trp Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Leu Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Pro Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

```
Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Ala Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile Arg Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680

<210>  82
<211>  683
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Mutant MLV reverse transcriptase

<400>  82

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Val Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110
```

```
Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Lys Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Lys Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Ala Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
```

450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Ser Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 83
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 83

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Leu Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg

65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Tyr Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

```
Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Val Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 84
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 84

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30
```

```
Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
```

370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp His Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala Arg Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 85
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 85

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Ala
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Pro Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Thr Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335
```

```
Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Ser Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asn Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
```

675 680

<210> 86
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 86

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Cys
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu

290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Val Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Ala Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu His Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

```
Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 87
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 87

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Ala Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu Arg Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255
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```
Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Gly Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Asp Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Ala Gly Ser Ser Ile
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
```

595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 88
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 88

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Val Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Ser Ser Pro Thr Leu Phe Asp Glu Ala Leu Arg Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp

```
210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Ala Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Ala Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560
```

```
Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 89
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 89

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175
```

```
Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Gly Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Ala Gly Ser Ser Leu
```

515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Gly Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 90
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 90

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln

```
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln His Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480
```

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Ile Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 91
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 91

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Leu Trp Asn Thr
85 90 95

```
Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
```

435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Arg Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 92
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 92

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Val Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Val Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr

```
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Arg Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu Arg Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Ala Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400
```

```
Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Lys Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Leu Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala His Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 93
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 93

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Thr Lys Glu
1               5                  10                  15
```

```
Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Thr Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
```

355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Thr Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asn Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 94
<211> 683
<212> PRT

<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 94

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Ser Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Ala Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Pro Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Leu Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320
```

```
Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Gly Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Thr Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Lys Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
```

660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 95
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 95

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val

```
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Thr Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Leu Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile Gln Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620
```

```
Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Pro Thr
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 96
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 96

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Pro Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240
```

```
Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Val Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
```

580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 97
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 97

Thr Leu Asn Ile Glu Asp Glu His Arg Leu Tyr Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala

```
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu His Pro Leu Thr Lys Thr Gly Thr Gln Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Arg Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540
```

```
Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Thr Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Lys Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Ser Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Arg Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Gly Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 98
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 98

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Leu Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Glu Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160
```

```
His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Val Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Thr Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Thr Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Pro Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
```

500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Thr Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 99
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 99

Thr Leu Asn Ile Glu Asp Glu His Arg Leu Arg Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr

```
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Met Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr Arg Tyr Gln Ala Leu Leu
    450                 455                 460
```

```
Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Val His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Gly Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Ala Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
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<210> 100
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 100

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Thr Lys Pro His Ile Gln Arg
65                  70                  75                  80
```

```
Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Arg Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu His Pro Leu Thr Lys Thr Gly Thr Gln Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Arg Pro Leu
```

420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Thr Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Lys Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Ser Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Arg Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Gly Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 101
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 101

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu

```
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Ser Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380
```

```
Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Gly Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Pro Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 102
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 102

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Ser Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Leu Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
```

```
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Arg Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Ala Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Lys Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu His Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Val Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 103
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 103

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Pro Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Ser Asn Pro Tyr Asn Leu Leu Gly Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300
```

```
Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Thr Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Gly Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Thr Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asn Gln Ala Ala
```

645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Pro Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 104
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 104

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile Arg Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu

260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Val Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Pro Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

```
Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Ala Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 105
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 105

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220
```

```
Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
```

565 570 575

Lys Leu Asn Val Tyr Thr Ala Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 106
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 106

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe

180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 107
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 107

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Val Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
130 135 140

```
Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asp Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
```

485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

Leu Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 108
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 108

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val

```
          100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Gly Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Arg Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445
```

```
Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 109
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 109

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60
```

```
Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile Ser Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
```

405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Gly Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 110
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 110

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

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

```
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Gly Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365
```

```
Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Ala Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Gly Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 111
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 111

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
```

325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asp Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Lys Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

```
Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 112
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 112

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Gly Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Gly Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Arg Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285
```

```
Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Lys Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Gly Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Val Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
```

625 630 635 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 113
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 113

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala

245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Ala Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

```
Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 114
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 114

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205
```

```
Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Pro Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Val Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
```

545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Ala Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 115
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 115

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Ile Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu

165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

```
Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680

<210>  116
<211>  683
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Mutant MLV reverse transcriptase

<400>  116

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Ser Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125
```

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Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu Arg Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Asp Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Ser Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
```

465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 117
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 117

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Met

85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

```
Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Pro Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Gly Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680

<210>  118
<211>  683
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Mutant MLV reverse transcriptase

<400>  118

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45
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```
Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
     50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Ser Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Gly Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Arg Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
```

385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Lys Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 119
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 119

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu

```
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350
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```
Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asn Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Phe Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 120

<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 120

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Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                  10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Lys Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Glu Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
```

```
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Phe Leu Pro Lys Arg Leu Ser Ile Thr His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly Arg Gly Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655
```

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 121
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 121

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Ser Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Lys Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

```
Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Ser Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Pro Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
```

610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asn Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 122
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 122

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asn Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Arg Gln Gly Thr

```
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Pro Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575
```

```
Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

Ser Leu Pro Lys Arg Leu Ser Ile Ile His Cys Pro Gly His Gln Lys
625                 630                 635                 640

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asn Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 123
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 123

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Ser Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Glu Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190
```

```
Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asp Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Val Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala His Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
```

530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Gly Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Lys Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 124
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 124

Thr Leu Asn Ile Glu Asp Glu Pro Arg Leu His Glu Thr Ser Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu

145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
180 185 190

Lys Asn Ser Pro Ala Leu Phe Gly Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
325 330 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Trp Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

```
Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Val Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Ala Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680
```

<210> 125
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 125

```
Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110
```

```
Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
```

450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala His Gln Ala Ala
645 650 655

Arg Lys Ala Ala Ile Ala Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
675 680

<210> 126
<211> 683
<212> PRT
<213> Artificial Sequence

<220>
<223> Mutant MLV reverse transcriptase

<400> 126

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Pro Lys Glu
1 5 10 15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
20 25 30

Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
35 40 45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
50 55 60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg

65 70 75 80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Ser Thr
85 90 95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
100 105 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
115 120 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Pro Pro Pro Ser His Gln
130 135 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145 150 155 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
165 170 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Arg Gly Phe
180 185 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
195 200 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
210 215 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225 230 235 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
245 250 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
260 265 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
275 280 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
290 295 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305 310 315 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Gln Phe Asn Trp
325 330 335

Gly Pro Gly Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
340 345 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
355 360 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Ala Leu Thr Pro Lys
370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

```
Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Gly Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Arg Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Leu Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
        675                 680

<210>  127
<211>  683
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Mutant MLV reverse transcriptase

<400>  127

Thr Leu Asn Ile Glu Asp Glu His Arg Leu His Glu Thr Ser Lys Glu
1               5                   10                  15

Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
            20                  25                  30
```

```
Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Arg Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly Tyr Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Thr Arg Lys Glu Ala Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335

Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Ile Val Asp Glu Lys Gln Gly Cys Ala Lys Gly Val Leu Thr Gln Lys
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370 375 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385 390 395 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
405 410 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
420 425 430

Val Thr Leu Ala Pro His Ala Val Glu Ala Leu Val Lys Gln Pro Pro
435 440 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
450 455 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465 470 475 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
485 490 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
500 505 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
515 520 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
530 535 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545 550 555 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
565 570 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
580 585 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
595 600 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
610 615 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
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Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
660 665 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
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Pro Asp Val Ser Leu Gly Ser Thr Trp Leu Ser Asp Phe Pro Gln Ala
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Trp Ala Glu Thr Gly Gly Met Gly Leu Ala Val Arg Gln Ala Pro Leu
        35                  40                  45

Ile Ile Pro Leu Lys Ala Thr Ser Thr Pro Val Ser Ile Lys Gln Tyr
    50                  55                  60

Pro Met Ser Gln Glu Ala Arg Leu Gly Ile Lys Pro His Ile Gln Arg
65                  70                  75                  80

Leu Leu Asp Gln Gly Ile Leu Val Pro Cys Gln Ser Pro Trp Asn Thr
                85                  90                  95

Pro Leu Leu Pro Val Lys Lys Pro Gly Thr Asn Asp Tyr Arg Pro Val
            100                 105                 110

Gln Asp Leu Arg Glu Val Asn Lys Arg Val Glu Asp Ile His Pro Thr
        115                 120                 125

Val Pro Asn Pro Tyr Asn Leu Leu Ser Gly Leu Pro Pro Ser His Gln
    130                 135                 140

Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe Phe Cys Leu Arg Leu
145                 150                 155                 160

His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu Trp Arg Asp Pro Glu
                165                 170                 175

Met Gly Ile Ser Gly Gln Leu Thr Trp Thr Arg Leu Pro Gln Gly Phe
            180                 185                 190

Lys Asn Ser Pro Thr Leu Phe Asp Glu Ala Leu His Arg Asp Leu Ala
        195                 200                 205

Asp Phe Arg Ile Gln His Pro Asp Leu Ile Leu Leu Gln Tyr Val Asp
    210                 215                 220

Asp Leu Leu Leu Ala Ala Thr Ser Glu Leu Asp Cys Gln Gln Gly Thr
225                 230                 235                 240

Arg Ala Leu Leu Gln Thr Leu Gly Asn Leu Gly His Arg Ala Ser Ala
                245                 250                 255

Lys Lys Ala Gln Ile Cys Gln Lys Gln Val Lys Tyr Leu Gly Tyr Leu
            260                 265                 270

Leu Lys Glu Gly Gln Arg Trp Leu Thr Glu Ala Arg Lys Glu Thr Val
        275                 280                 285

Met Gly Gln Pro Thr Pro Lys Thr Pro Arg Gln Leu Arg Glu Phe Leu
    290                 295                 300

Gly Thr Ala Ser Phe Cys Arg Leu Trp Ile Pro Gly Phe Ala Glu Met
305                 310                 315                 320

Ala Ala Pro Leu Tyr Pro Leu Thr Lys Thr Gly Thr Leu Phe Asn Trp
                325                 330                 335
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Gly Pro Asp Gln Gln Lys Ala Tyr Gln Glu Ile Lys Gln Ala Leu Leu
            340                 345                 350

Thr Ala Pro Ala Leu Gly Leu Pro Asp Leu Thr Lys Pro Phe Glu Leu
        355                 360                 365

Phe Val Asp Glu Lys Gln Gly Tyr Ala Lys Gly Val Leu Thr Gln Lys
    370                 375                 380

Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu Ser Lys Lys Leu Asp
385                 390                 395                 400

Pro Val Ala Ala Gly Trp Pro Pro Cys Leu Arg Met Val Ala Ala Ile
                405                 410                 415

Ala Val Leu Thr Lys Asp Ala Gly Lys Leu Thr Met Gly Gln Pro Leu
            420                 425                 430

Val Ile Leu Ala Pro His Ala Val Gly Ala Leu Val Lys Gln Pro Pro
        435                 440                 445

Asp Arg Trp Leu Ser Asn Ala Arg Met Thr His Tyr Gln Ala Leu Leu
    450                 455                 460

Leu Asp Thr Asp Arg Val Gln Phe Gly Pro Val Val Ala Leu Asn Pro
465                 470                 475                 480

Ala Thr Leu Leu Pro Leu Pro Glu Glu Gly Leu Gln His Asn Cys Leu
                485                 490                 495

Asp Ile Leu Ala Glu Ala His Gly Thr Arg Pro Asp Leu Thr Asp Gln
            500                 505                 510

Pro Leu Pro Asp Ala Asp His Thr Trp Tyr Thr Asp Gly Ser Ser Leu
        515                 520                 525

Leu Gln Glu Gly Gln Arg Lys Ala Gly Ala Ala Val Thr Thr Glu Thr
    530                 535                 540

Glu Val Ile Trp Ala Lys Ala Leu Pro Ala Gly Thr Ser Ala Gln Arg
545                 550                 555                 560

Ala Glu Leu Ile Ala Leu Thr Gln Ala Leu Lys Met Ala Glu Gly Lys
                565                 570                 575

Lys Leu Asn Val Tyr Thr Asp Ser Arg Tyr Ala Phe Ala Thr Ala His
            580                 585                 590

Ile His Gly Glu Ile Tyr Arg Arg Arg Gly Trp Leu Thr Ser Glu Gly
        595                 600                 605

Lys Glu Ile Lys Asn Lys Asp Glu Ile Leu Ala Leu Leu Lys Ala Leu
    610                 615                 620

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

Gly His Ser Ala Glu Ala Arg Gly Asn Arg Met Ala Asp Gln Ala Ala
                645                 650                 655

Arg Lys Ala Ala Ile Thr Glu Thr Pro Asp Thr Ser Thr Leu Leu Ile
            660                 665                 670

Glu Asn Ser Ser Pro Asn Ser Arg Leu Ile Asn
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675 680