```
                  10        20        30        40        50        60        70        80
           ....|....| ....|....| ....|....| ....|....| ....|....| ....|....| ....|....| ....|....|
JCV  VP1   MAPTKRKGER KDPVQVPKLL IRGGVEVLEV KTGVDSITEV ECFLTPEMGD PDEHLRGFSK SISISDTFES DSPNKDMLPC
SV40 COA1  --PKKPK--- -EPVQVPKLV IKGGIEVLGV KTGVDSFTEV ECFLNPQMGN PDEHQKGLSK SLAAEKQFTD DSPDKEQLPC

                  90        100       110       120       130       140       150       160
           ....|....| ....|....| ....|....| ....|....| ....|....| ....|....| ....|....| ....|....|
JCV  VP1   YSVARIPLPN LNEDLTCGNI LMWEAVTLKT EVIGVTTLMN VHSNGQATHD NGAAKPVQGT SFHFFSVGGE ALELQGVVFN
SV40 COA1  YSVARIPLPN INEDLTCGNI LMWEAVTVKT EVIGVTAMLN LHSGTQKTHE NGAGKPIQGS NFHFFAVGGE PLELQGVLAN

                  170       180       190       200       210       220       230       240
           ....|....| ....|....| ....|....| ....|....| ....|....| ....|....| ....|....| ....|....|
JCV  VP1   YRTTYPDGTI FPKNATVQSQ VMNTEHKAYL DKNKAYPVEC WVPDPTRNEN TRYFGTLTGG ENVPPVLHIT NTATTVLLDE
SV40 COA1  YRTKYPAQTV TPKNATVDSQ QMNTDHKAVL DKDNAYPVEC WVPDPSKNEN TRYFGTYTGG ENVPPVLHIT NTATTVLLDE

                  250       260       270       280       290       300       310       320
           ....|....| ....|....| ....|....| ....|....| ....|....| ....|....| ....|....| ....|....|
JCV  VP1   FGVGPLCKGD NLYLSAVDVC GMFTNRSGSQ QWRGLSRYFK VQLRKRRVKN PYPISFLLTD LINRRTPRVD GQPMYGMDAQ
SV40 COA1  QGVGPLCKAD SLYVSAVDIC GLFTNTSGTQ QWKGLPRYFK ITLRKRSVKN PYPISFLLSD LINRRTQRVD GQPMIGMSSQ

                  330       340       350
           ....|....| ....|....| ....|....| ....
JCV  VP1   IEEVRVFEGT EQLPGDPDMM RYVDRYGQLQ TKML
SV40 COA1  VEEVRVYEDT EELPGDPDMI RYIDEFGQTT TRMQ
```

Fig. 1



Fig. 2

VP1 from Brain Samples of PML subjects:

>AAB60584 gi|1161319|gb|AAB60584.1| VP1
NVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLSRYFKVQLRKRRVKN
PYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDRYGQLQTKML
(SEQ ID NO: 3)

>AAB60586 gi|1161322|gb|AAB60586.1| VP1
NVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLSRYFKVQLRKRRVKN
PYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDRYGQLQTKML
(SEQ ID NO: 4)

>AAB62687 gi|2246615|gb|AAB62687.1| VP1 [JC virus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHFRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTTLMNVHSNGQAAHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 5)

>AAB94036 gi|2735983|gb|AAB94036.1| VP1 [JC virus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHFRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTTLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTTYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 6)

>BAA01965 gi|425206|dbj|BAA01965.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTTLMNVHSNGQAAHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGFQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 7)

>BAA01966 gi|425207|dbj|BAA01966.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISHTFE
SDSPNRDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTSLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVLFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDK
YGQLQTKML
(SEQ ID NO: 8)

>BAA01967 gi|425208|dbj|BAA01967.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTSLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVLFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRLGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDK
YGQLQTKML
(SEQ ID NO: 9)

Fig. 3-1

>BAA01968 gi|425209|dbj|BAA01968.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPSKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTSLMNVHSNGQAAHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDK
YGQLQTKML
(SEQ ID NO: 10)

>BAA01969 gi|425210|dbj|BAA01969.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVLGVTTLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGFQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 11)

>BAA01970 gi|425211|dbj|BAA01970.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVLGVTTLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 12)

>BAA05636 gi|538231|dbj|BAA05636.1| VP1 (capsid protein) [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVLGVTTLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 13)

>BAA05637 gi|538234|dbj|BAA05637.1| VP1 (capsid protein) [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVLGVTTLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGFQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 14)

>BAA05638 gi|538238|dbj|BAA05638.1| VP1 (capsid protein) [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTTLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGYQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 15)

Fig. 3-2

>BAB11728 gi|9796436|dbj|BAB11728.1| VP1 capsid protein [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVLGVTTLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGFQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 16)

>BAB11734 gi|9796443|dbj|BAB11734.1| VP1 capsid protein [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTTLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGYQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 17)

>BAE00111 gi|67968154|dbj|BAE00111.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPSKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTSLMNVHSNGQAAHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDK
YGQLQTKML
(SEQ ID NO: 18)

>BAE00117 gi|67968161|dbj|BAE00117.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPSKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTSLMNVHSNGQAAHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGFQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDK
YGQLQTKML
(SEQ ID NO: 19)

>BAE00123 gi|67968168|dbj|BAE00123.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPSKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTSLMNVHSNGQAAHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGFQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDK
YGQLQTKML
(SEQ ID NO: 20)

>BAE00127 gi|67968173|dbj|BAE00127.1| VP2 [JC polyomavirus]
MGAALALLGDLVATVSEAAAATGFSVAEIAAGEAAATIEVEIASLATVEGITSTSEAIAAIGLTPETYA
VITGAPGAVAGFAALVQTVTGGSAIAQLGYRFFADWDHKVSTVGLFQQPAMALQLFNPEDYYDILFPGV
NAFVNNIHYLDPRHWGPSLFSTISQAFWNLVRDDLPSLTSQEIQRRTQKLFVESLARFLEETTWAIVNS
PVNLYNYISDYYSRLSPVRPSMVRQVAQREGTYISFGHSYTQSIDDADSIQEVTQRLDLKTPNVQSGEF
IEKSIAPGGANQRSAPQWMLPLLLGLYGTVTPALEAYEDGPNKKKRRKEGPRASSKTSYKRRSRSSRS
(SEQ ID NO: 21)

Fig. 3-3

>BAE00129 gi|67968175|dbj|BAE00129.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTTLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 22)

>BAE00135 gi|67968182|dbj|BAE00135.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKLISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTTLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 23)

>BAE00141 gi|67968189|dbj|BAE00141.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTTLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 24)

>BAE00147 gi|67968204|dbj|BAE00147.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVLGVTTLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 25)

>BAE00153 gi|67968211|dbj|BAE00153.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVLGVTTLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGYQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 26)

>BAE00159 gi|67968218|dbj|BAE00159.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSMSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVLGVTTLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 27)

Fig. 3-4

>BAE00165 gi|67968225|dbj|BAE00165.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVLGVTTLMNVHCNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 28)

>BAE00171 gi|67968232|dbj|BAE00171.1| VP1 [JC polyomavirus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVLGVTTLMNVHCNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 29)

>BAE02837 gi|68445619|dbj|BAE02837.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISDTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VIGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRSGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 30)

>BAE02838 gi|68445621|dbj|BAE02838.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISHTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VIGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRSGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 31)

>BAE02839 gi|68445623|dbj|BAE02839.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISNTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VIGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRSGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 32)

>BAE02840 gi|68445625|dbj|BAE02840.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSESISISHTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VIGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRSGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 33)

>BAE02841 gi|68445627|dbj|BAE02841.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISDTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VLGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRFGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 34)

Fig. 3-5

>BAE02842 gi|68445629|dbj|BAE02842.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSMSISISDTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VIGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRSGSQHWRGLSRYFKVQLRKRR
(SEQ ID NO: 35)

>BAE02843 gi|68445631|dbj|BAE02843.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISHTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VIGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRSGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 36)

>BAE02844 gi|68445633|dbj|BAE02844.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISDTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VLGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRSGFQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 37)

>BAE02845 gi|68445635|dbj|BAE02845.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISDTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VLGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRFGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 38)

>BAE02846 gi|68445637|dbj|BAE02846.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISDTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VIGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENAPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRSGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 39)

>BAE02847 gi|68445639|dbj|BAE02847.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISDTFDSDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VIGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRSGFQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 40)

VP1 from Non-brain Samples of PML subjects:
>AAB62680 gi|2246607|gb|AAB62680.1| VP1 [JC virus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTTLMNVHSNGQAAHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQVEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 41)

Fig. 3-6

>AAT09819 gi|47078338|gb|AAT09819.1| VP1 [JC virus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVLGVTTLMNVHSNGQATHDNGAGKPVQ
GTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTTRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQIEEVRVFEGTEELPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 42)

>AAT09825 gi|47078345|gb|AAT09825.1| VP1 [JC virus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTTLMNVHSNGQATHDNGAAKPVQ
GTSFHFFSVGGEALELQGVVFNYRTTYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRFGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQIEEVRVFEGTEQLPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 43)

>AAT09831 gi|47078352|gb|AAT09831.1| VP1 [JC virus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHFRGFSKSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTTLMNVHSNGQATHDNGAAKPVQ
GTSFHFFSVGGEALELQGVVFNYRTTYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQIEEVRVFEGTEQLPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 44)

>AAT09837 gi|47078359|gb|AAT09837.1| VP1 [JC virus]
MAPTKRKGERKDPVQVPKLLIRGGVEVLEVKTGVDSITEVECFLTPEMGDPDEHLRGFSNSISISDTFE
SDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTEVIGVTTLMNVHSNGQATHDNGAAKPVQ
GTSFHFFSVGGEALELQGVVFNYRTTYPDGTIFPKNATVQSQVMNTEHKAYLDKNKAYPVECWVPDPTR
NENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKGDNLYLSAVDVCGMFTNRSGSQQWRGLS
RYFKVQLRKRRVKNPYPISFLLTDLINRRTPRVDGQPMYGMDAQIEEVRVFEGTEQLPGDPDMMRYVDR
YGQLQTKML
(SEQ ID NO: 45)

>BAE02848 gi|68445641|dbj|BAE02848.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISDTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VLGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTDRSGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 46)

>BAE02849 gi|68445643|dbj|BAE02849.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHFRGFSKSISISDTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VIGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRSGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 47)

Fig. 3-7

>BAE02850 gi|68445645|dbj|BAE02850.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISDTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VLGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTDRSGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 48)

>BAE02851 gi|68445647|dbj|BAE02851.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISDTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VLGVTTLMNVHCNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRSGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 49)

>BAE02852 gi|68445649|dbj|BAE02852.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISDTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VIGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRSGFQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 50)

>BAE02853 gi|68445651|dbj|BAE02853.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISDTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VLGVTTLMNVHCNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRSGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 51)

>BAE02854 gi|68445653|dbj|BAE02854.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHFRGFSKSISISDTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VIGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRSGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 52)

>BAE02855 gi|68445655|dbj|BAE02855.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISDTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VIGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTNRSGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 53)

>BAE02856 gi|68445657|dbj|BAE02856.1| VP1 protein [JC polyomavirus]
FLTPEMGDPDEHLRGFSKSISISDTFESDSPNKDMLPCYSVARIPLPNLNEDLTCGNILMWEAVTLKTE
VIGVTTLMNVHSNGQATHDNGAGKPVQGTSFHFFSVGGEALELQGVVFNYRTKYPDGTIFPKNATVQSQ
VMNTEHKAYLDKNKAYPVECWVPDPTRNENTRYFGTLTGGENVPPVLHITNTATTVLLDEFGVGPLCKG
DNLYLSAVDVCGMFTDRSGSQQWRGLSRYFKVQLRKRR
(SEQ ID NO: 54)

Fig. 3-8

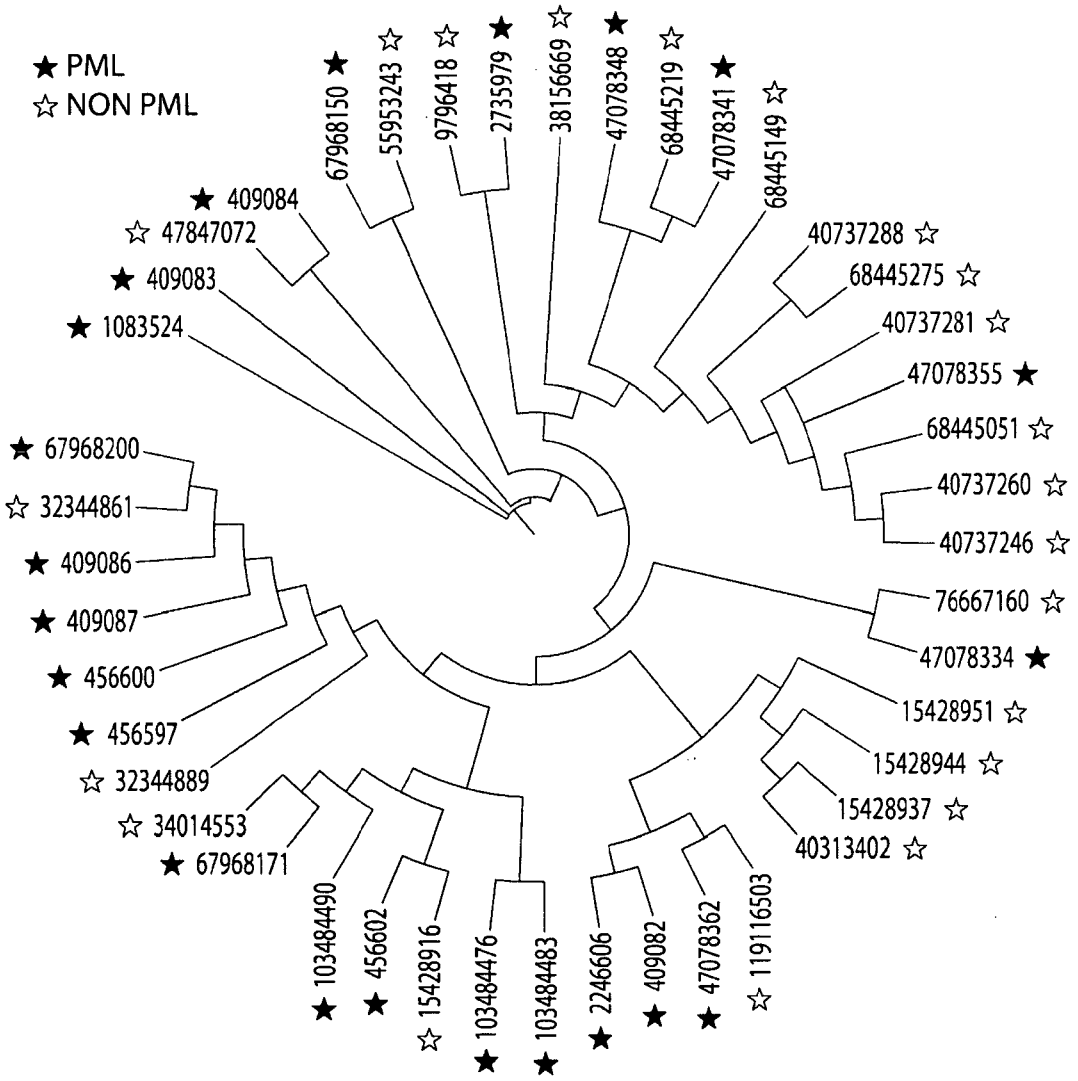

★ PML
☆ NON PML
★ 67968150
☆ 55953243
☆ 9796418
★ 2735979
☆ 38156669
★ 47078348
☆ 68445219
★ 47078341
☆ 68445149
☆ 40737288
☆ 68445275
☆ 40737281
★ 47078355
☆ 68445051
☆ 40737260
☆ 40737246
☆ 76667160
★ 47078334
☆ 15428951
☆ 15428944
☆ 15428937
☆ 40313402
☆ 119116503
★ 47078362
★ 409082
★ 2246606
★ 103484483
★ 103484476
☆ 15428916
★ 456602
★ 103484490
★ 67968171
☆ 34014553
☆ 32344889
★ 456597
★ 456600
★ 409087
★ 409086
☆ 32344861
★ 67968200
★ 1083524
★ 409083
☆ 47847072
★ 409084

Fig. 4A

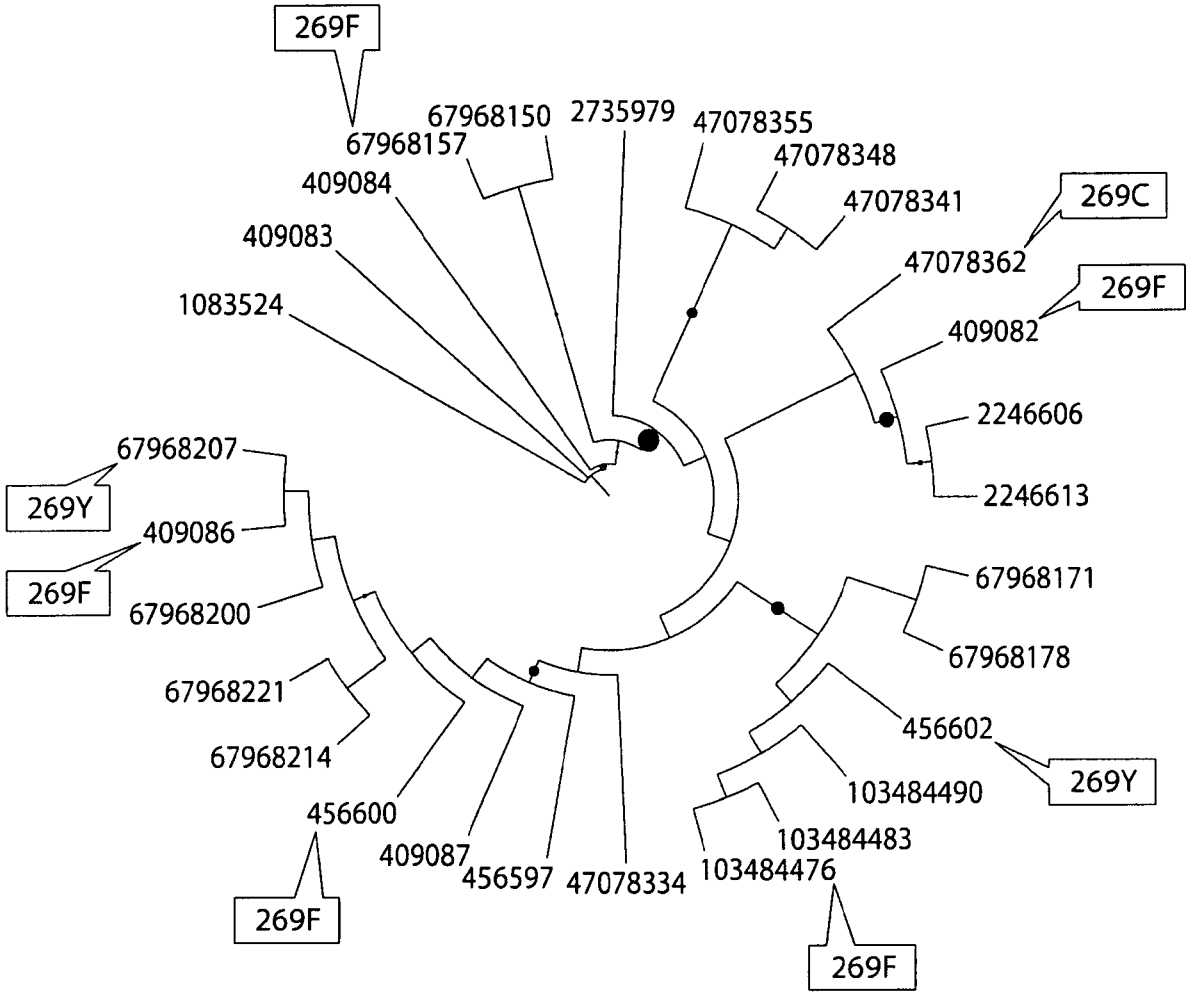

269F
67968157
67968150
2735979
47078355
47078348
47078341
269C
47078362
269F
409082
2246606
2246613
67968171
67968178
456602
269Y
103484490
103484483
103484476
269F
47078334
456597
409087
456600
269F
67968221
67968214
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409086
269F
67968207
269Y
1083524
409083
409084

Fig. 4B

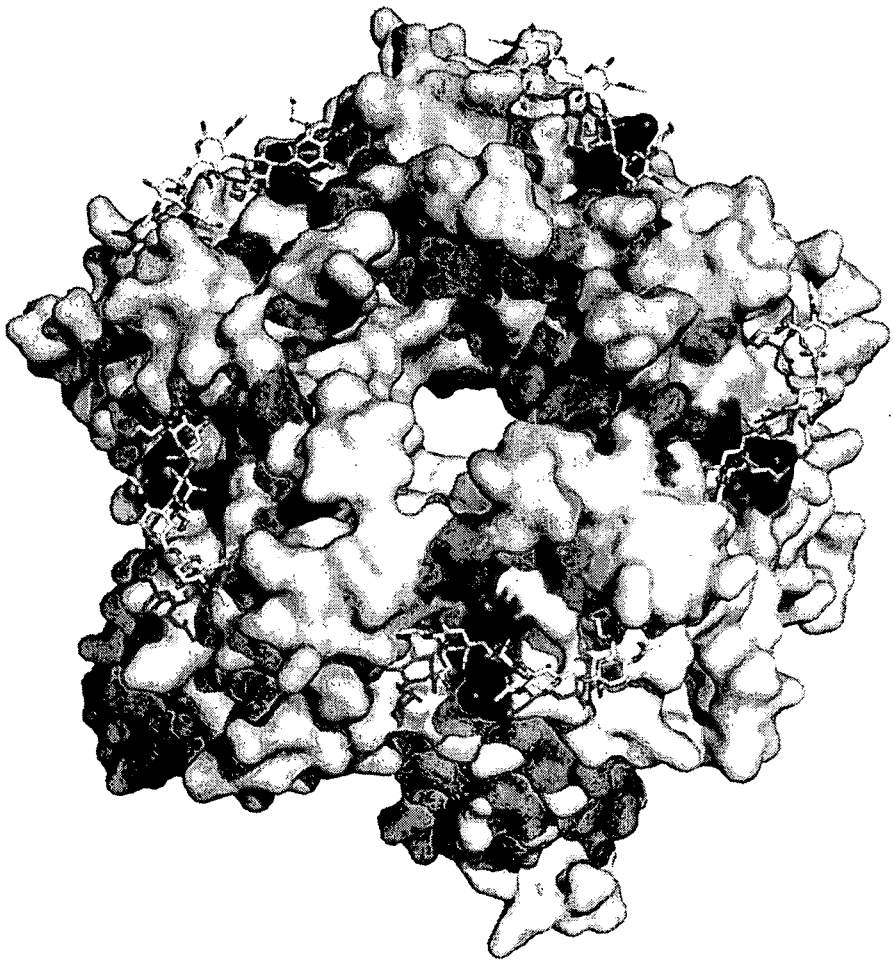


Fig. 5A


H129
V223
S267
MPyV
V296
N265
S269
D66
K60
S61
S123
G57
Q271
L55
R56

Fig. 5B

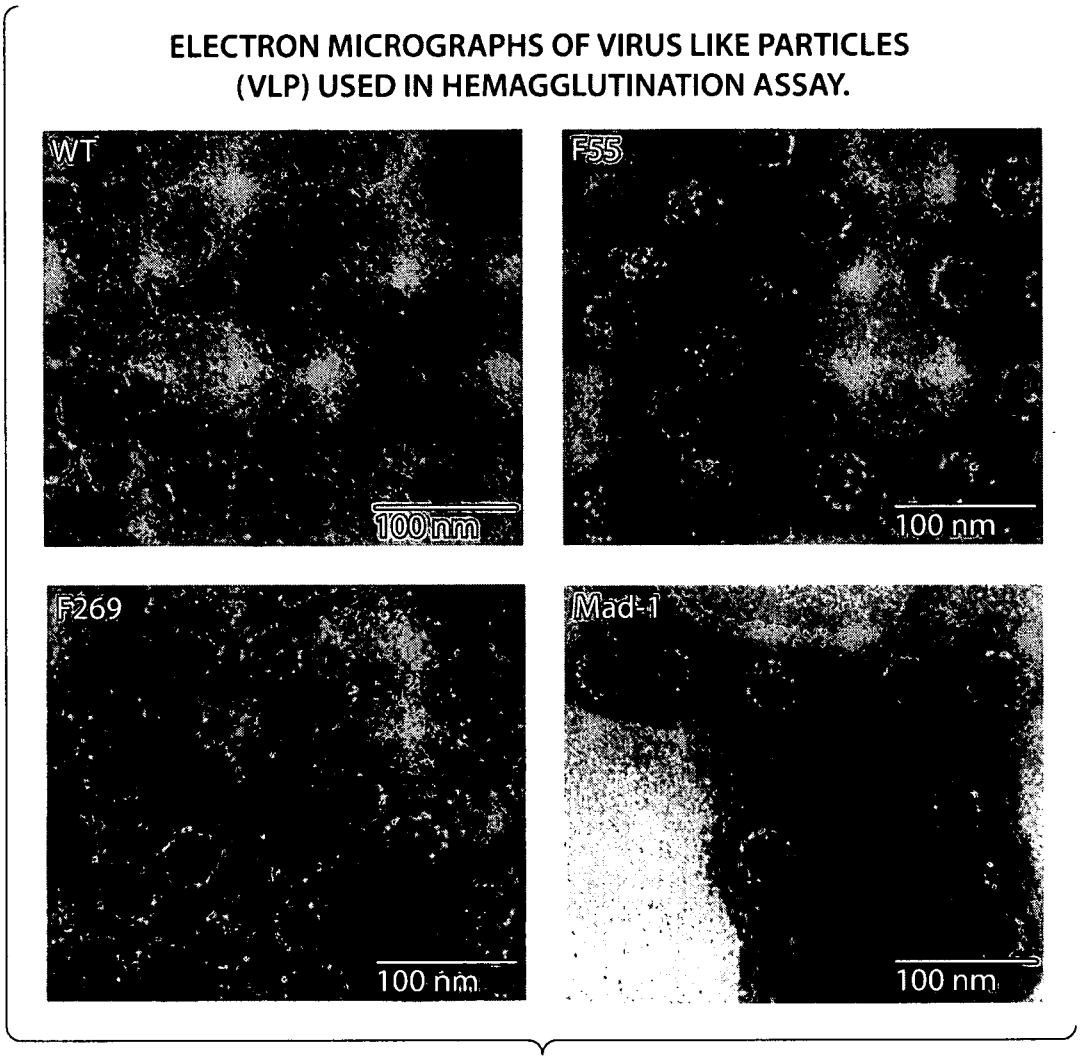

ELECTRON MICROGRAPHS OF VIRUS LIKE PARTICLES
(VLP) USED IN HEMAGGLUTINATION ASSAY.
WT
100 nm
F55
100 nm
F269
100 nm
Mad-1
100 nm

Fig. 6

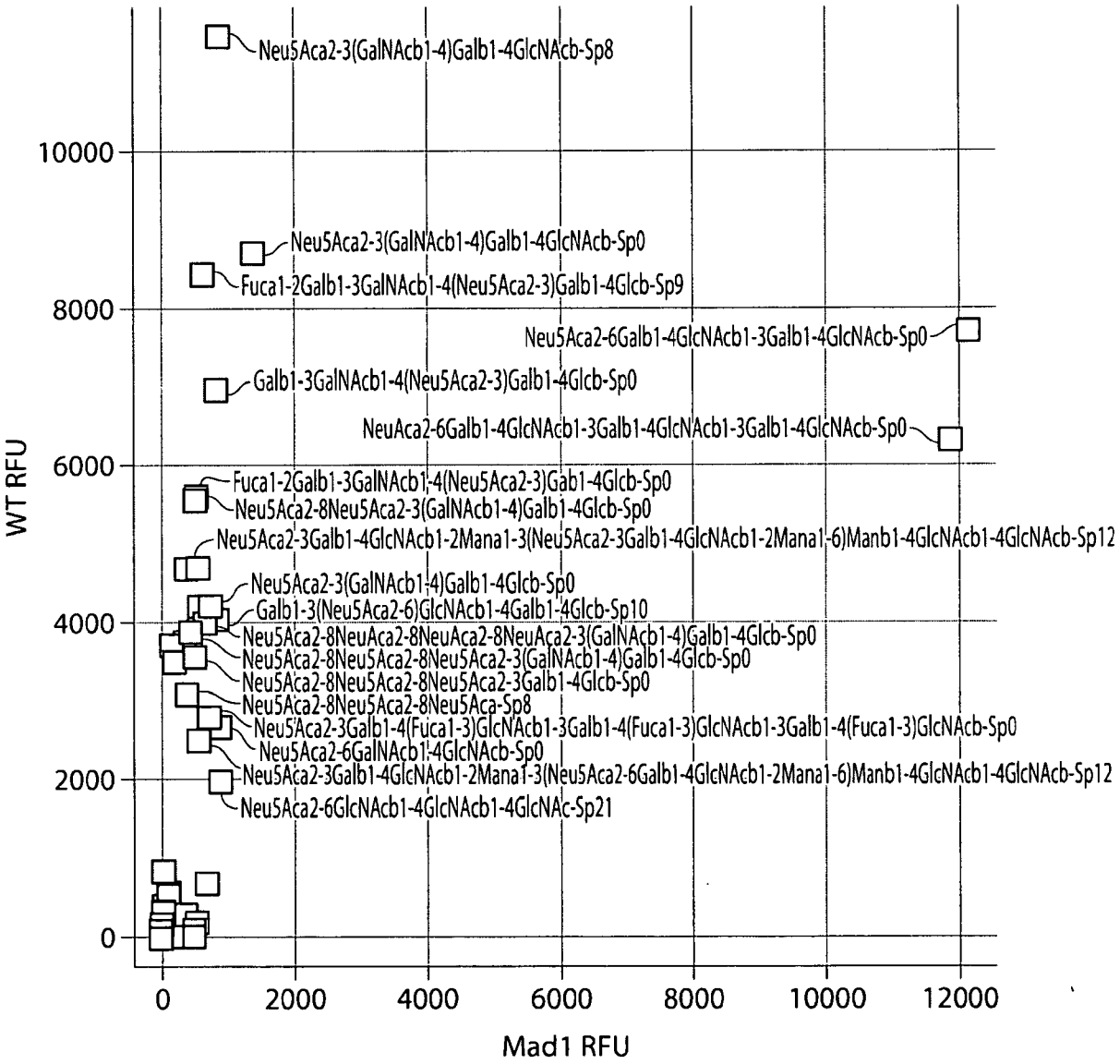

Neu5Aca2-3(GalNAcb1-4)Galb1-4GlcNAcb-Sp8
Neu5Aca2-3(GalNAcb1-4)Galb1-4GlcNAcb-Sp0
Fuca1-2Galb1-3GalNAcb1-4(Neu5Aca2-3)Galb1-4Glcb-Sp9
Neu5Aca2-6Galb1-4GlcNAcb1-3Galb1-4GlcNAcb-Sp0
Galb1-3GalNAcb1-4(Neu5Aca2-3)Galb1-4Glcb-Sp0
NeuAca2-6Galb1-4GlcNAcb1-3Galb1-4GlcNAcb1-3Galb1-4GlcNAcb-Sp0
Fuca1-2Galb1-3GalNAcb1-4(Neu5Aca2-3)Gab1-4Glcb-Sp0
Neu5Aca2-8Neu5Aca2-3(GalNAcb1-4)Galb1-4Glcb-Sp0
Neu5Aca2-3Galb1-4GlcNAcb1-2Mana1-3(Neu5Aca2-3Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12
Neu5Aca2-3(GalNAcb1-4)Galb1-4Glcb-Sp0
Galb1-3(Neu5Aca2-6)GlcNAcb1-4Galb1-4Glcb-Sp10
Neu5Aca2-8NeuAca2-8NeuAca2-8NeuAca2-3(GalNAcb1-4)Galb1-4Glcb-Sp0
Neu5Aca2-8Neu5Aca2-8Neu5Aca2-3(GalNAcb1-4)Galb1-4Glcb-Sp0
Neu5Aca2-8Neu5Aca2-8Neu5Aca2-3Galb1-4Glcb-Sp0
Neu5Aca2-8Neu5Aca2-8Neu5Aca-Sp8
Neu5Aca2-3Galb1-4(Fuca1-3)GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb1-3Galb1-4(Fuca1-3)GlcNAcb-Sp0
Neu5Aca2-6GalNAcb1-4GlcNAcb-Sp0
Neu5Aca2-3Galb1-4GlcNAcb1-2Mana1-3(Neu5Aca2-6Galb1-4GlcNAcb1-2Mana1-6)Manb1-4GlcNAcb1-4GlcNAcb-Sp12
Neu5Aca2-6GlcNAcb1-4GlcNAcb1-4GlcNAc-Sp21
10000
8000
6000
4000
2000
0
WT RFU
0
2000
4000
6000
8000
10000
12000
Mad1 RFU

Fig. 7

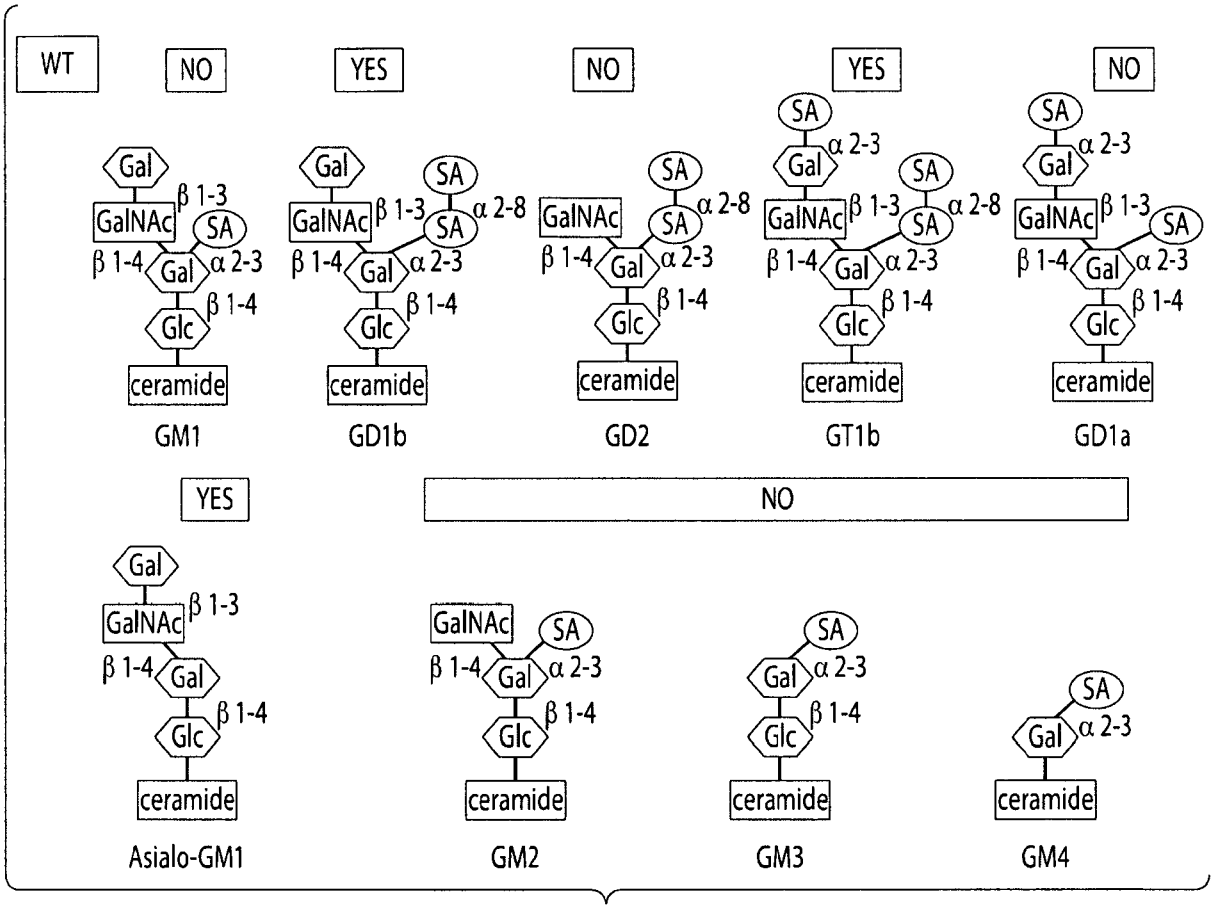

WT
NO
YES
NO
YES
NO
Gal
GalNAc
SA
Glc
ceramide
β 1-3
β 1-4
α 2-3
α 2-8
GM1
GD1b
GD2
GT1b
GD1a
YES
NO
Asialo-GM1
GM2
GM3
GM4

Fig. 8

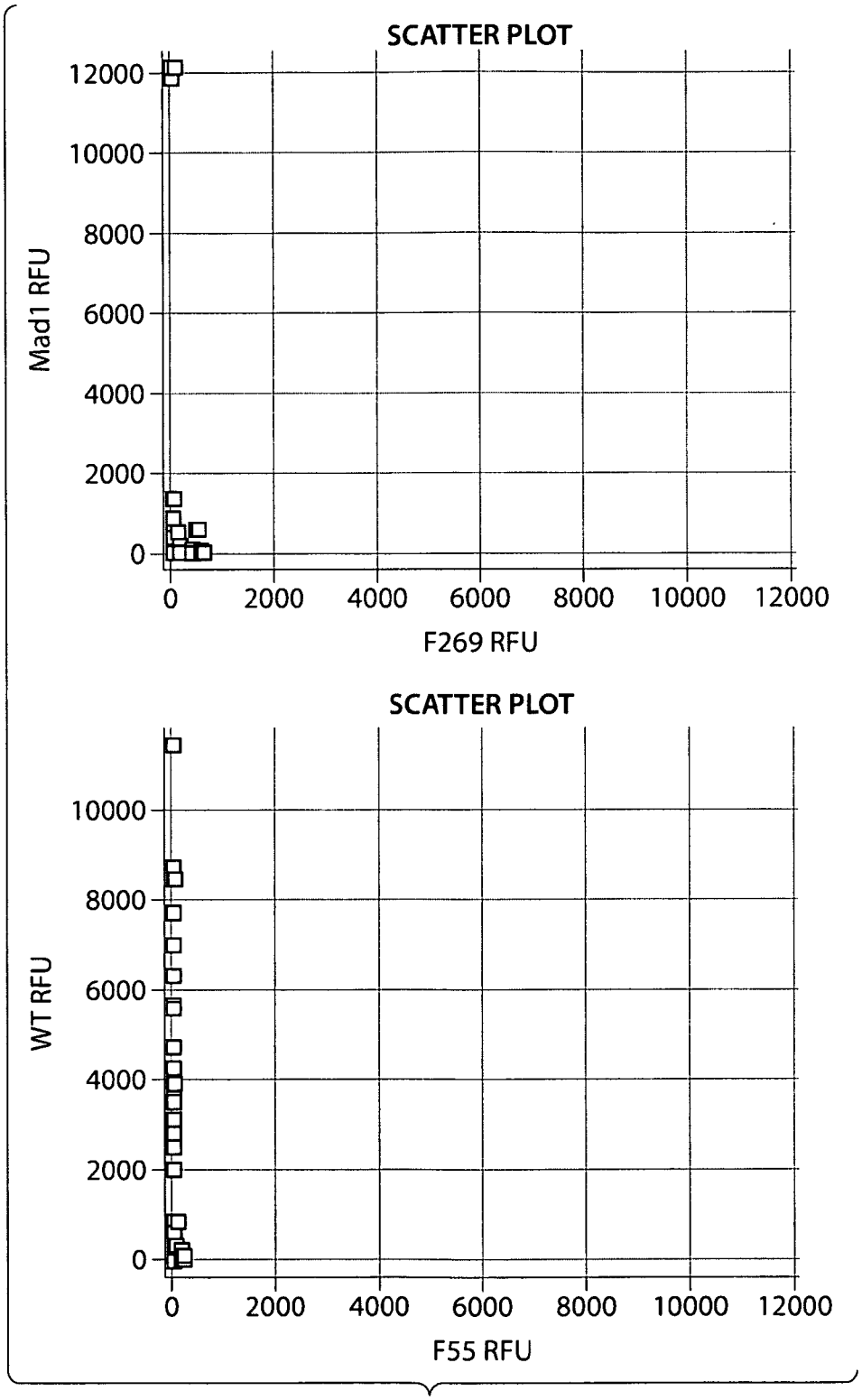

SCATTER PLOT
Mad1 RFU
12000
10000
8000
6000
4000
2000
0
0
2000
4000
6000
8000
10000
12000
F269 RFU
SCATTER PLOT
WT RFU
10000
8000
6000
4000
2000
0
0
2000
4000
6000
8000
10000
12000
F55 RFU

Fig. 9

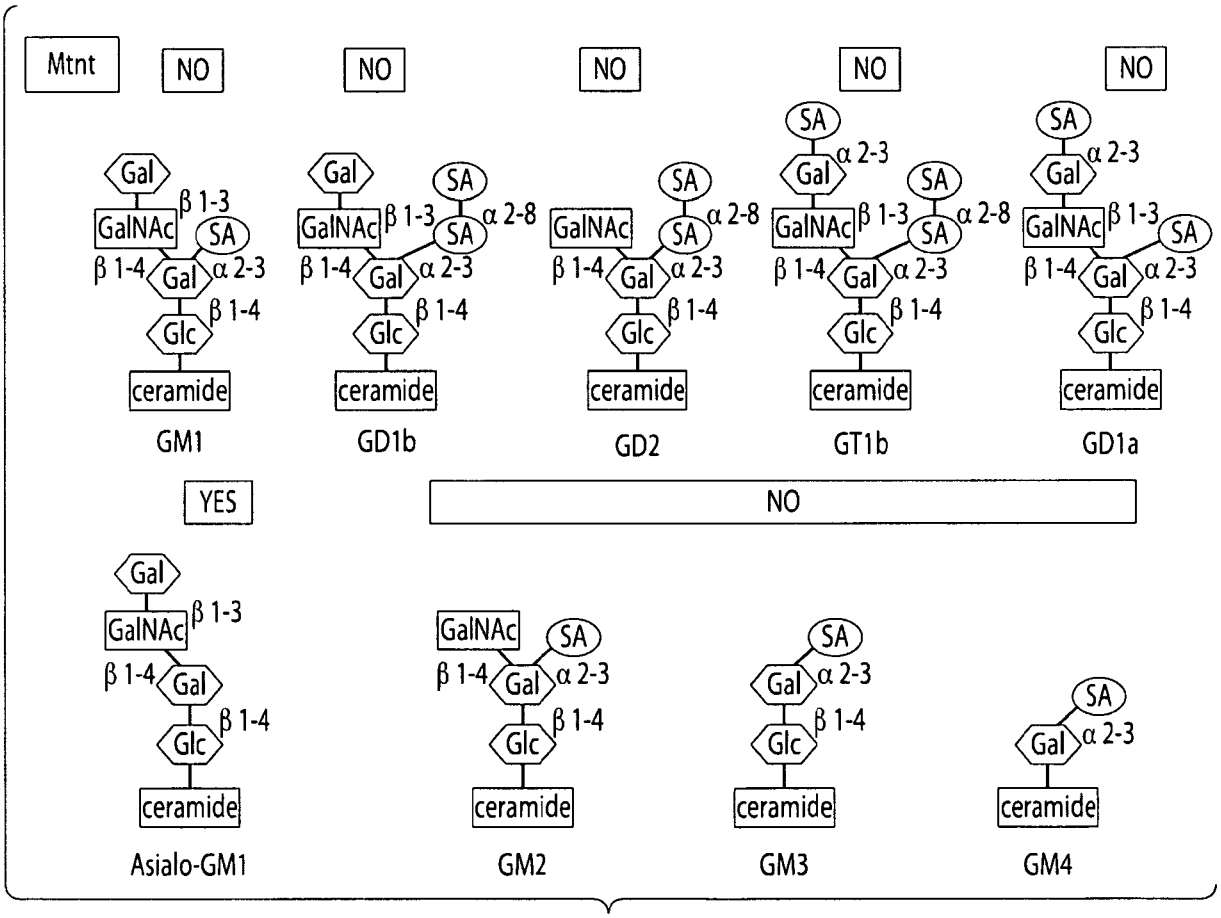

Mtnt
NO
NO
NO
NO
NO
Gal
GalNAc
SA
Glc
ceramide
β 1-3
β 1-4
α 2-3
α 2-8
GM1
GD1b
GD2
GT1b
GD1a
YES
NO
Asialo-GM1
GM2
GM3
GM4

Fig. 10

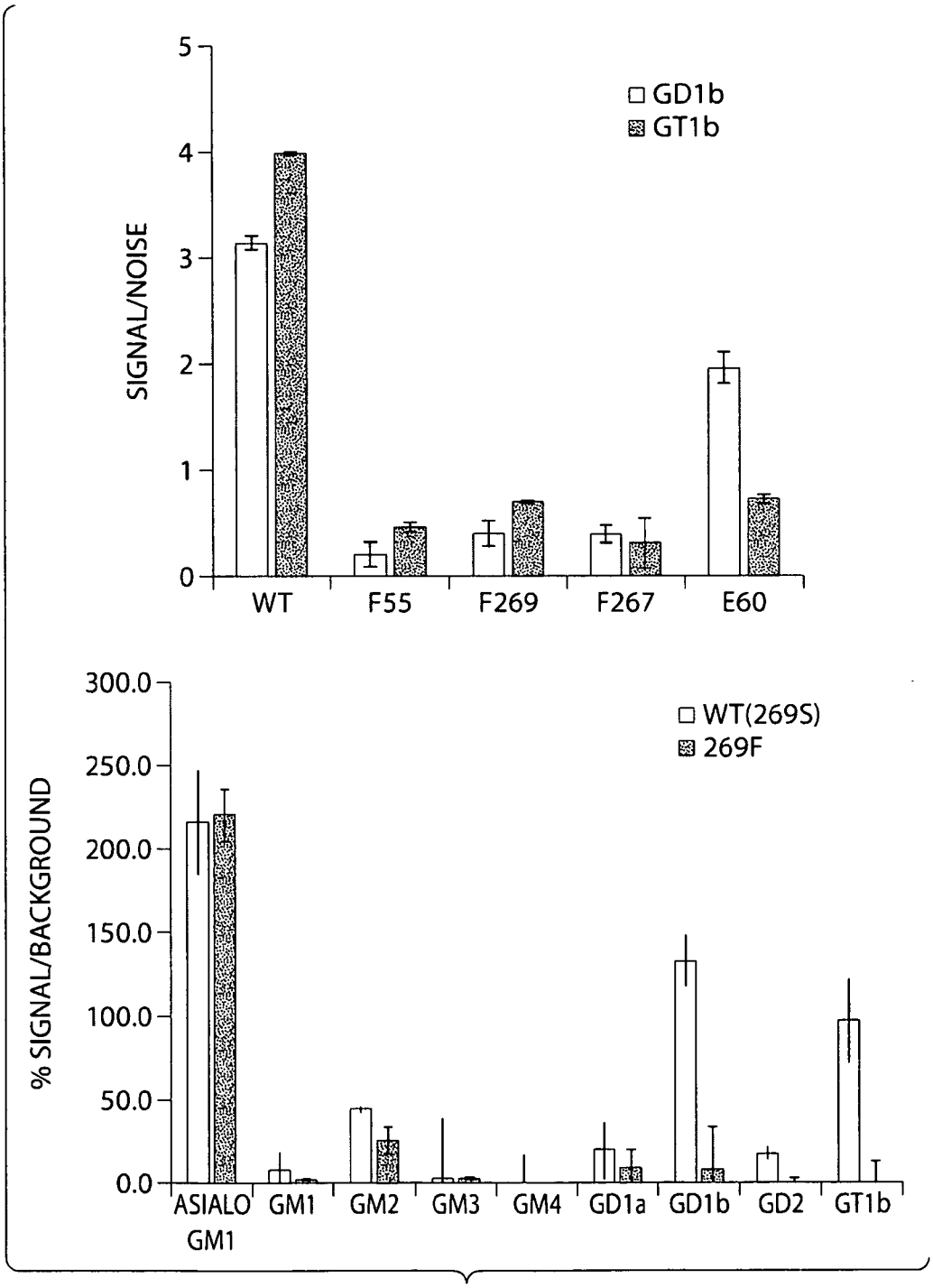

SIGNAL/NOISE
5
4
3
2
1
0
GD1b
GT1b
WT
F55
F269
F267
E60
% SIGNAL/BACKGROUND
300.0
250.0
200.0
150.0
100.0
50.0
0.0
WT(269S)
269F
ASIALO GM1
GM1
GM2
GM3
GM4
GD1a
GD1b
GD2
GT1b

Fig. 11

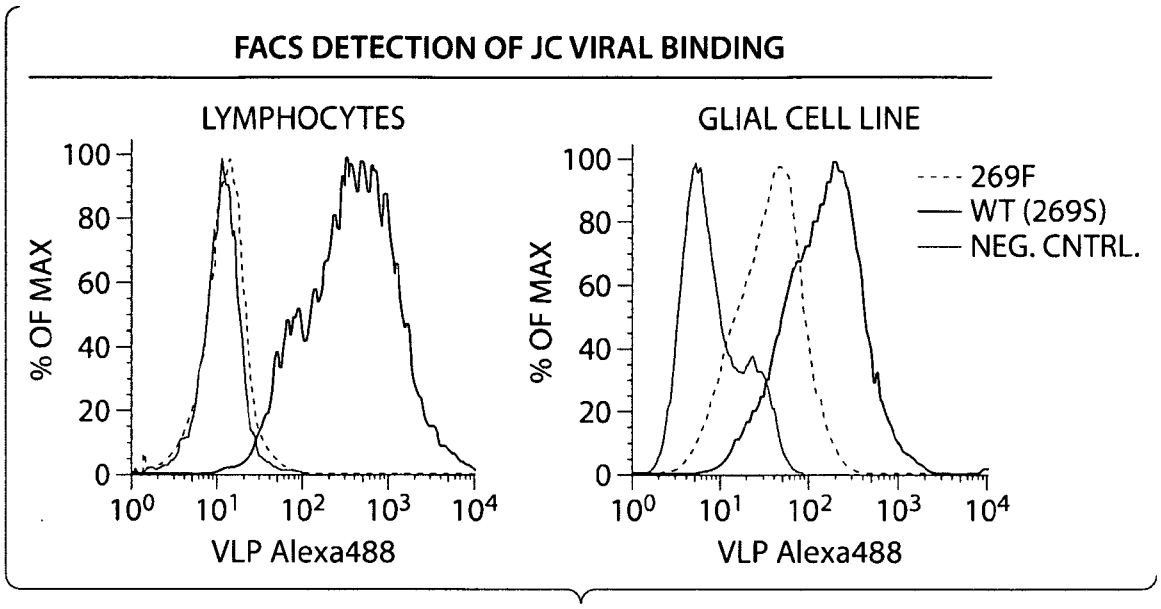

FACS DETECTION OF JC VIRAL BINDING
LYMPHOCYTES
GLIAL CELL LINE
% OF MAX
100
80
60
40
20
0
10^0 10^1 10^2 10^3 10^4
VLP Alexa488
269F
WT (269S)
NEG. CNTRL.

Fig. 12

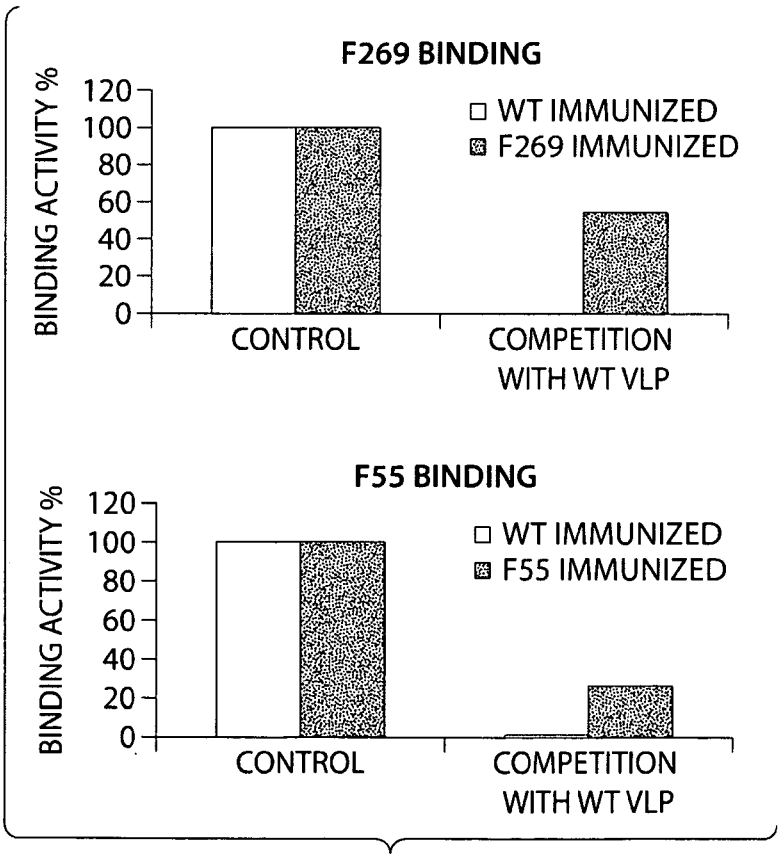

F269 BINDING
BINDING ACTIVITY %
120
100
80
60
40
20
0
WT IMMUNIZED
F269 IMMUNIZED
CONTROL
COMPETITION WITH WT VLP
F55 BINDING
BINDING ACTIVITY %
WT IMMUNIZED
F55 IMMUNIZED
CONTROL
COMPETITION WITH WT VLP

Fig. 13

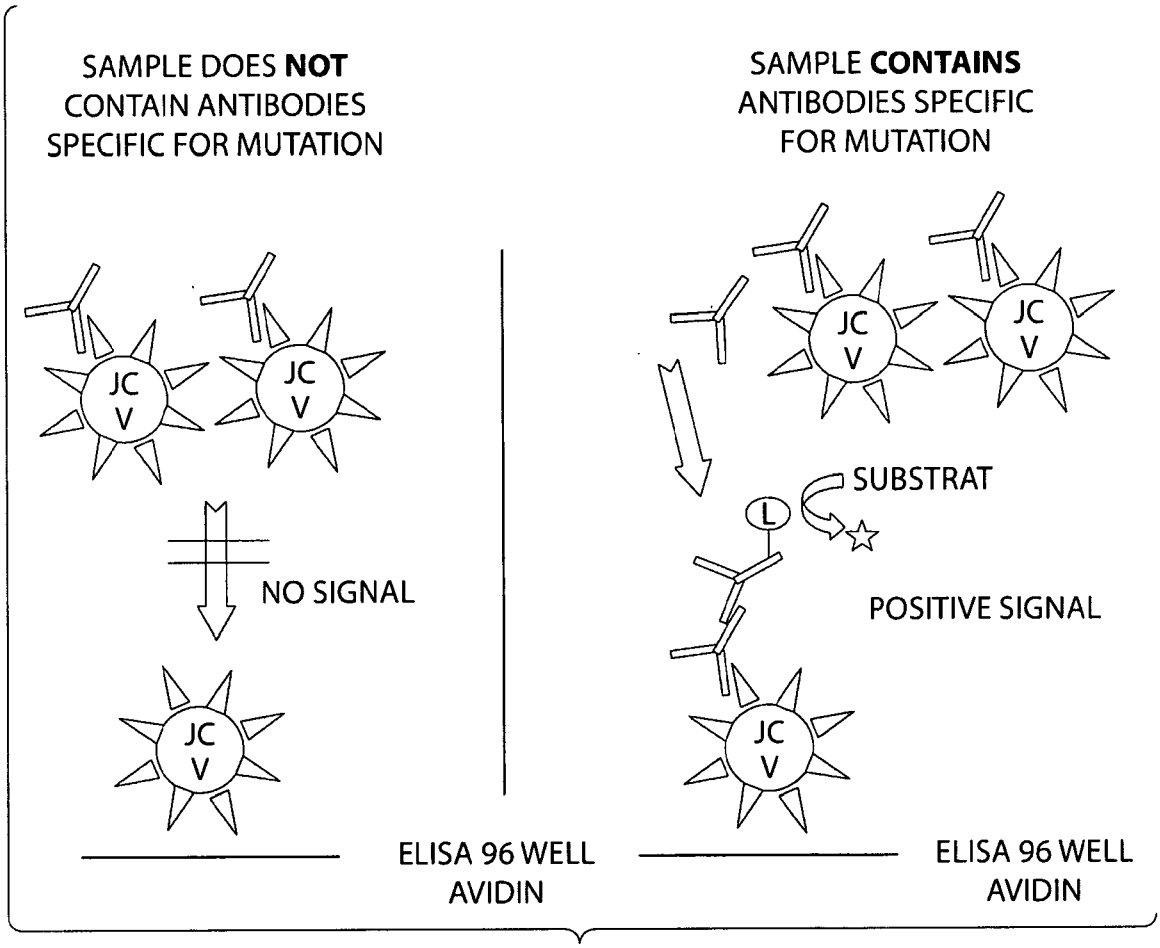

SAMPLE DOES **NOT** CONTAIN ANTIBODIES SPECIFIC FOR MUTATION
SAMPLE **CONTAINS** ANTIBODIES SPECIFIC FOR MUTATION
JC V
JC V
NO SIGNAL
JC V
JC V
JC V
SUBSTRAT
L
POSITIVE SIGNAL
JC V
ELISA 96 WELL AVIDIN
ELISA 96 WELL AVIDIN

Fig. 14

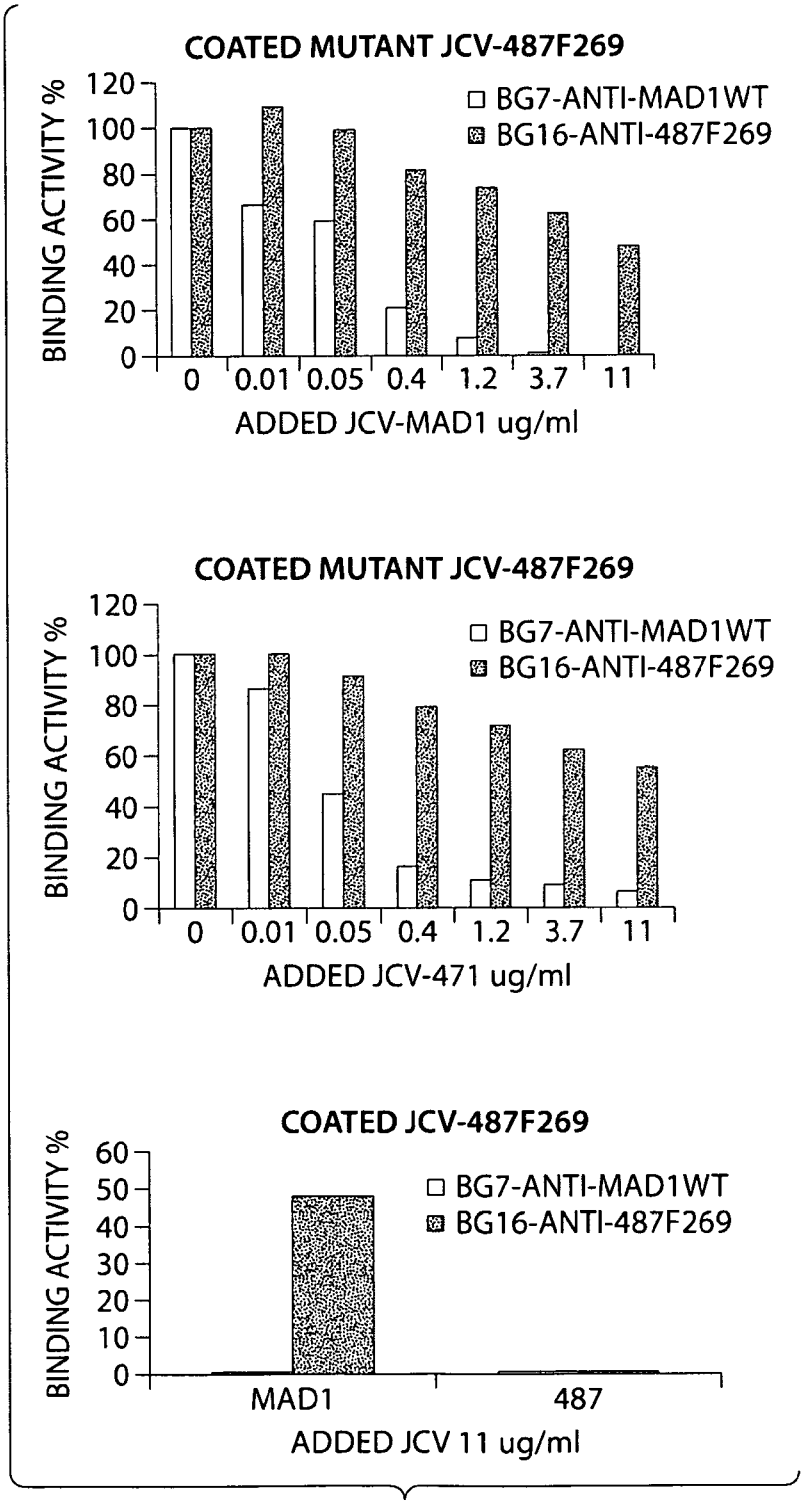

COATED MUTANT JCV-487F269
BINDING ACTIVITY %
120
100
80
60
40
20
0
BG7-ANTI-MAD1WT
BG16-ANTI-487F269
0
0.01
0.05
0.4
1.2
3.7
11
ADDED JCV-MAD1 ug/ml
COATED MUTANT JCV-487F269
BINDING ACTIVITY %
120
100
80
60
40
20
0
BG7-ANTI-MAD1WT
BG16-ANTI-487F269
0
0.01
0.05
0.4
1.2
3.7
11
ADDED JCV-471 ug/ml
COATED JCV-487F269
BINDING ACTIVITY %
60
50
40
30
20
10
0
BG7-ANTI-MAD1WT
BG16-ANTI-487F269
MAD1
487
ADDED JCV 11 ug/ml

Fig. 15

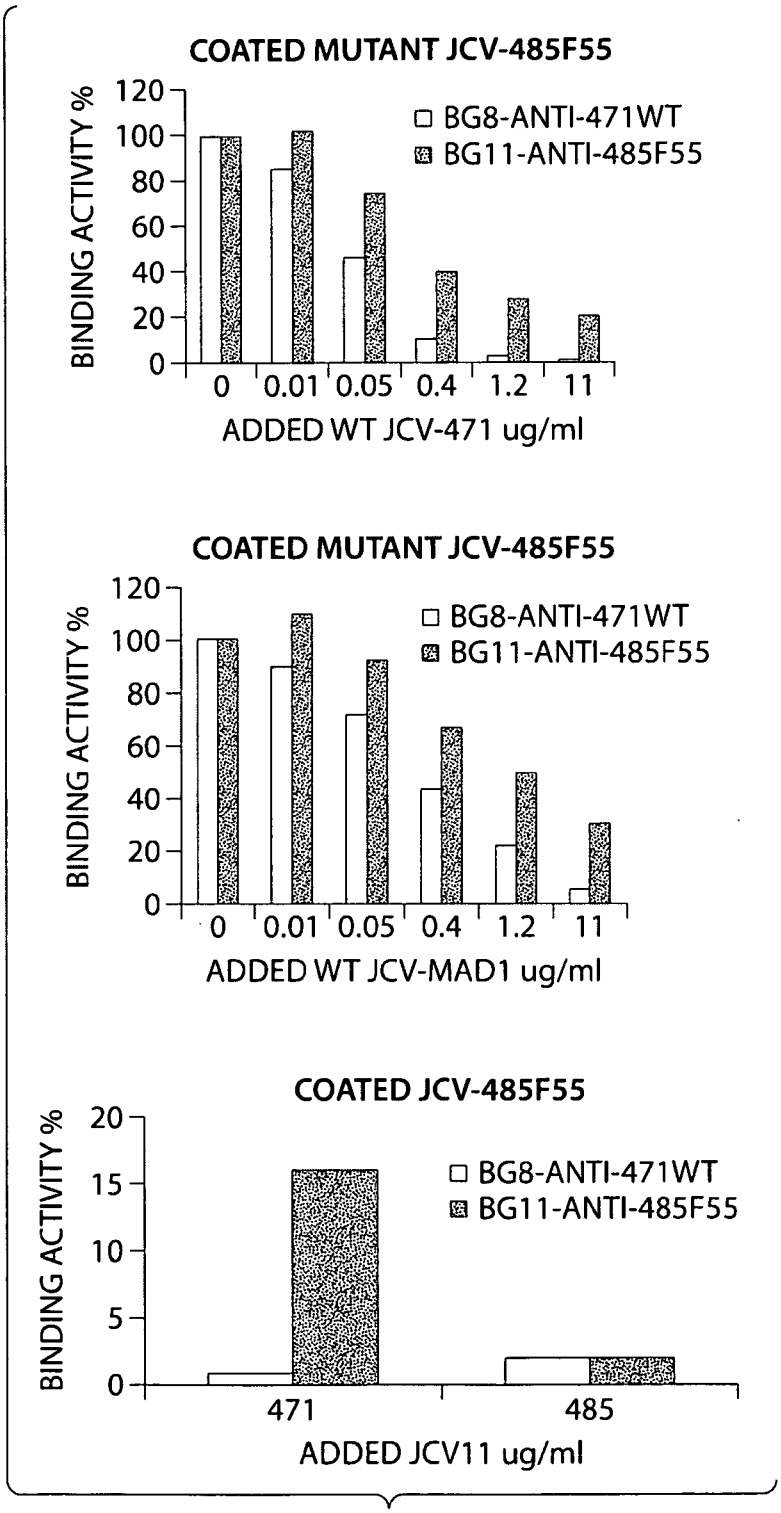

COATED MUTANT JCV-485F55
BINDING ACTIVITY %
120
100
80
60
40
20
0
BG8-ANTI-471WT
BG11-ANTI-485F55
0
0.01
0.05
0.4
1.2
11
ADDED WT JCV-471 ug/ml
COATED MUTANT JCV-485F55
BINDING ACTIVITY %
120
100
80
60
40
20
0
BG8-ANTI-471WT
BG11-ANTI-485F55
0
0.01
0.05
0.4
1.2
11
ADDED WT JCV-MAD1 ug/ml
COATED JCV-485F55
BINDING ACTIVITY %
20
15
10
5
0
BG8-ANTI-471WT
BG11-ANTI-485F55
471
485
ADDED JCV11 ug/ml

Fig. 16

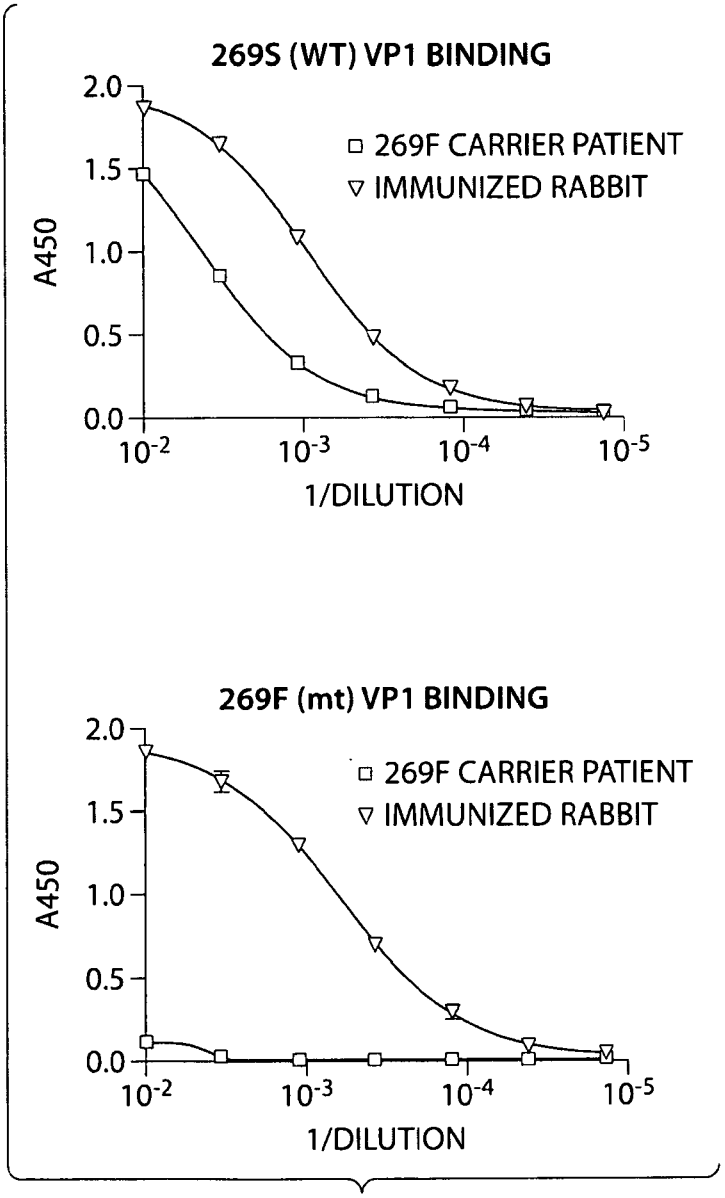

269S (WT) VP1 BINDING
2.0
1.5
1.0
0.5
0.0
A450
269F CARRIER PATIENT
IMMUNIZED RABBIT
10^{-2}
10^{-3}
10^{-4}
10^{-5}
1/DILUTION
269F (mt) VP1 BINDING
2.0
1.5
1.0
0.5
0.0
A450
269F CARRIER PATIENT
IMMUNIZED RABBIT
10^{-2}
10^{-3}
10^{-4}
10^{-5}
1/DILUTION

Fig. 17

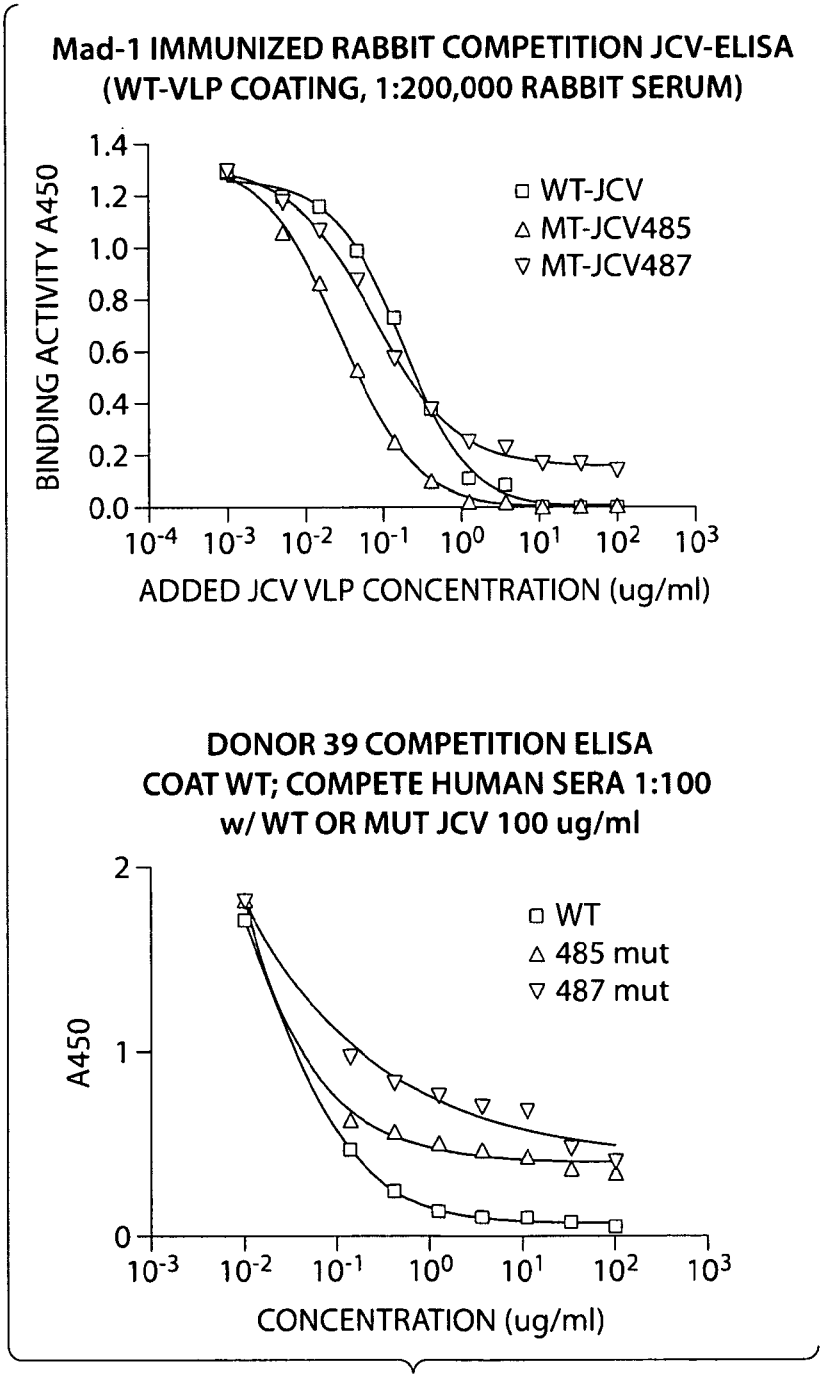

Mad-1 IMMUNIZED RABBIT COMPETITION JCV-ELISA
(WT-VLP COATING, 1:200,000 RABBIT SERUM)
BINDING ACTIVITY A450
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
WT-JCV
MT-JCV485
MT-JCV487
10-4 10-3 10-2 10-1 100 101 102 103
ADDED JCV VLP CONCENTRATION (ug/ml)
DONOR 39 COMPETITION ELISA
COAT WT; COMPETE HUMAN SERA 1:100
w/ WT OR MUT JCV 100 ug/ml
A450
2
1
0
WT
485 mut
487 mut
10-3 10-2 10-1 100 101 102 103
CONCENTRATION (ug/ml)

Fig. 18

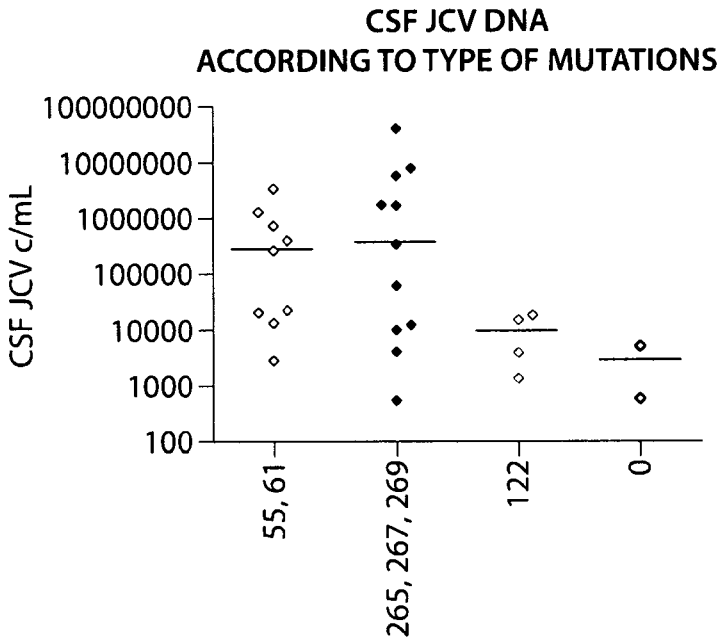

CSF JCV DNA
ACCORDING TO TYPE OF MUTATIONS
CSF JCV c/mL
100000000
10000000
1000000
100000
10000
1000
100
55, 61
265, 267, 269
122
0

Fig. 19

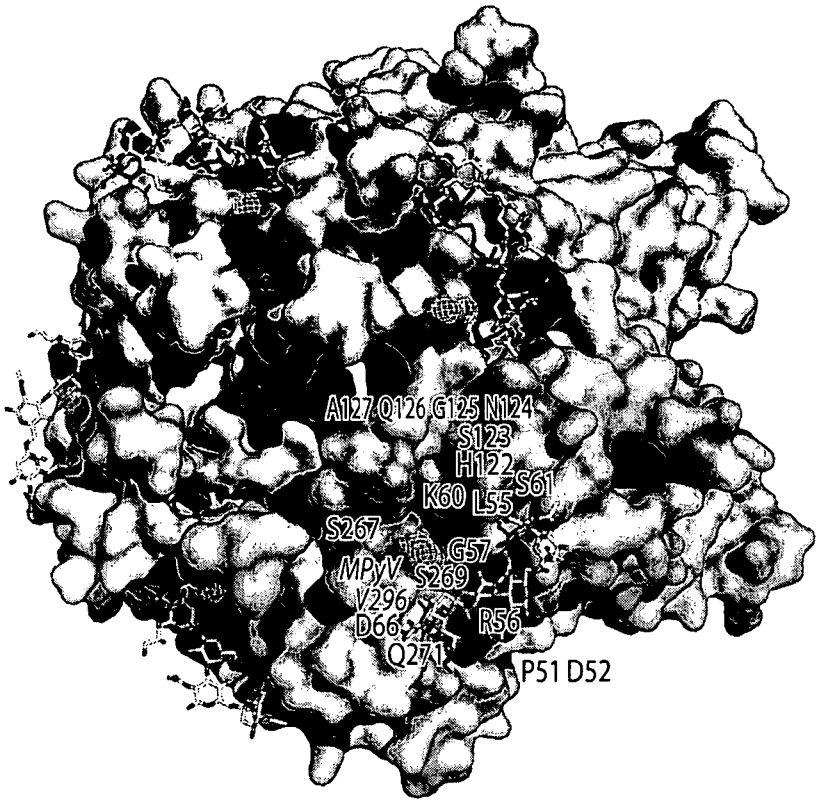


Fig. 20A

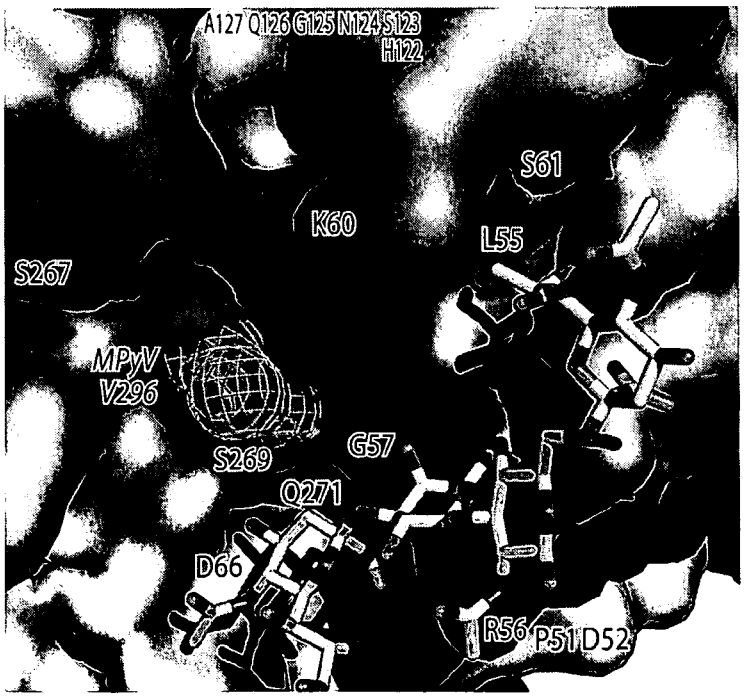
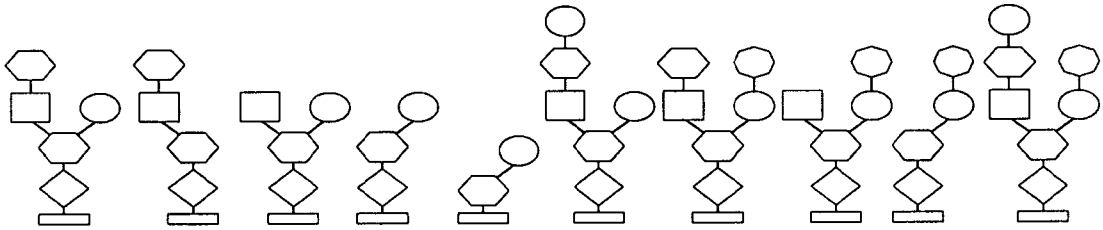


Fig. 20B



	GM_1	AsialoGM_1	GM_2	GM_3	GM_4	GD_{1a}	GD_{1b}	GD_2	GD_3	GT_{1b}
WILD TYPE	24	279	9	2	16	244	1393	1225	14	894
L55F	17	290	19	7	35	35	54	41	20	15
K60E	54	268	31	26	45	66	102	98	136	37
D66H	507	122	200	13	24	641	790	708	602	581
N265D	784	919	820	768	1080	963	1222	1087	947	878
S267F	47	158	36	27	66	43	72	74	46	36
S269F	59	313	41	22	70	55	100	76	58	46
S269Y	45	1023	48	15	49	60	73	68	32	23
Q271H	243	494	65	29	80	574	796	704	541	525



CERAMIDE GLUCOSAMINE Glc GALACTOSAMINE Gal N-ACETYLGALACTOSAMINE GalNAc SIALIC ACID α 2-3 SA SIALIC ACID α 2-8 SA

Fig. 21