FIGURE 1

A

M M M A S K D A T S S V D G A S G A G Q L V P E V N A S D P L A M
D P V A G S S T A V A T A G Q V N P I D P W I I N N F V Q A P Q G
E F T I S P N N T P G D V L F D L S L G P H L N P F L L H L S Q M
Y N G W V G N M R V R I M L A G N A F T A G K I I V S C I P P G F
G S H N L T I A Q A T L F P H V I A D V R T L D P I E V P L E D V
R N V L F H N N D R N Q Q T M R L V C M L Y T P L R T G G G T G D
S F V V A G R V M T C P S P D F N F L F L V P P T V E Q K T R P F
T L P N L P L S S L S N S R A P L P I S S M G I S P D N V Q S V Q
F Q N G R C T L D G R L V G T T P V S L S H V A K I R G **T S N G T**
V I N L T E L **D G T P F H P F E** G P A P I G F P D L G G C D W H I
N M T Q **F G H S S Q T Q** Y D V D T **T P D T** F V P H L G S I Q A **N G**
I G S G N Y V G V L S W I S P P **S H P S G S Q** V D L W K I P N Y G
S S I T E A T H L A P S V Y P P G F G E V L V F F M S K M P G P G
A Y N L P C L L P Q E Y I S H L A S E Q A P T V G E A A L L H Y V
D P D T G R N L G E F K A Y P D G F L T C V P N G A S S G P Q Q L
P I N G V F V F V S W V S R F Y Q L K P V G T A S S A R G R L G L
R R **(SEQ ID NO: 1)**

B

M K M A S S D A N P S D G S T A N L V P E V N N E V M A L E P V V
G A A I A A P V A G Q Q N V I D P W I R N N F V Q A P G G E F T V
S P R N A P G E I L W S A P L G P D L N P Y L S H L A R M Y N G Y
A G G F E V Q V I L A G N A F T A G K I I F A A V P P N F P T E G
L S P S Q V T M F P H I I V D V R Q L E P V L I P L P D V R N N F
Y H Y N Q S N D P T I K L I A M L Y T P L R A N N A G D D V F T V
S C R V L T R P S P D F D F I F L V P P T V E S R T K P F T V P I
L T V E E M T N S R F P I P L E K L F T G P S G A F V V Q P Q N G
R C T T D G V L L G T T Q L S P V N I C T F R G D V T H **I A G T Q**
E Y T M N L A S **Q N W N N Y D P T E E I** P A P L G T P D F V G K I
Q G V L T Q T **T R G D G S T R G** H K A T V S T **G S V H** F T P K L G
S V **Q F S T D T S N D F** E T G Q N T K F T P V G **V V Q D G S T T H**
Q N E P Q Q W V L P D Y S G R D S H N V H L A P A V A P T F P G E
Q L L F F R S T M P G C S G Y P N M N L D C L L P Q E W V Q H F Y
Q E A A P A Q S D V A L L R F V N P D T G R V L F E C K L H K S G
Y V T V A H T G Q H D L V I P P N G Y F R F D S W V N Q F Y T L A
P M G N G T G R R R A L **(SEQ ID NO: 2)**

FIGURE 2

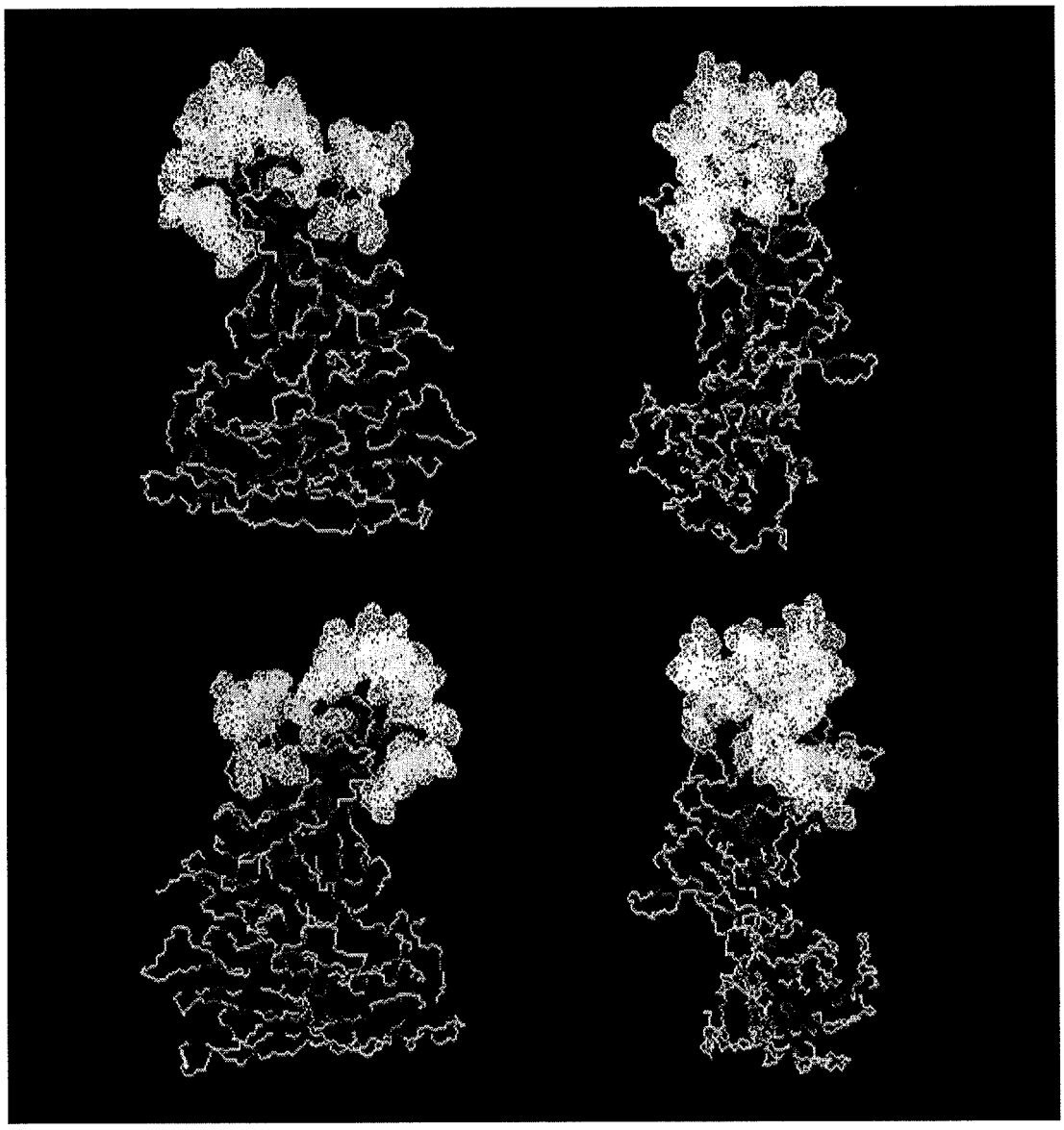
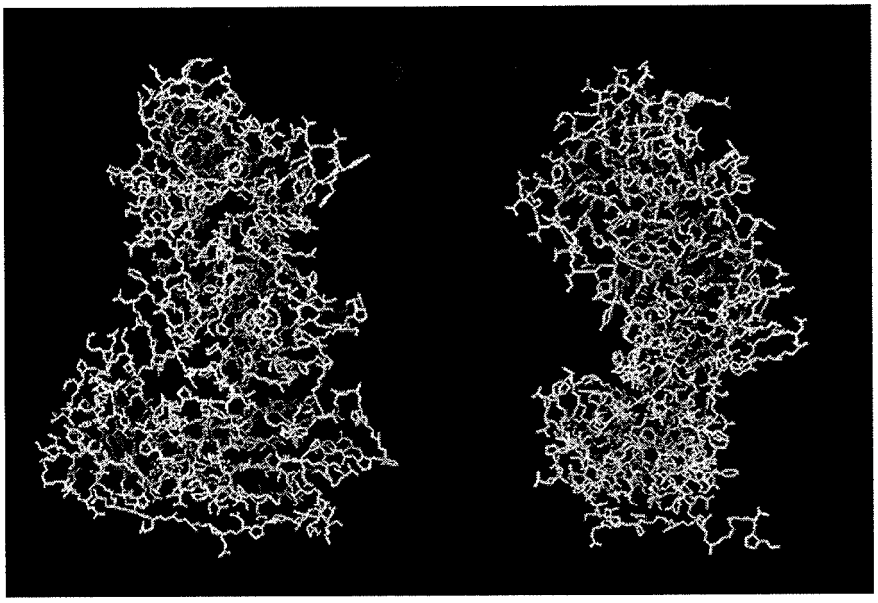


FIGURE 3

A



B

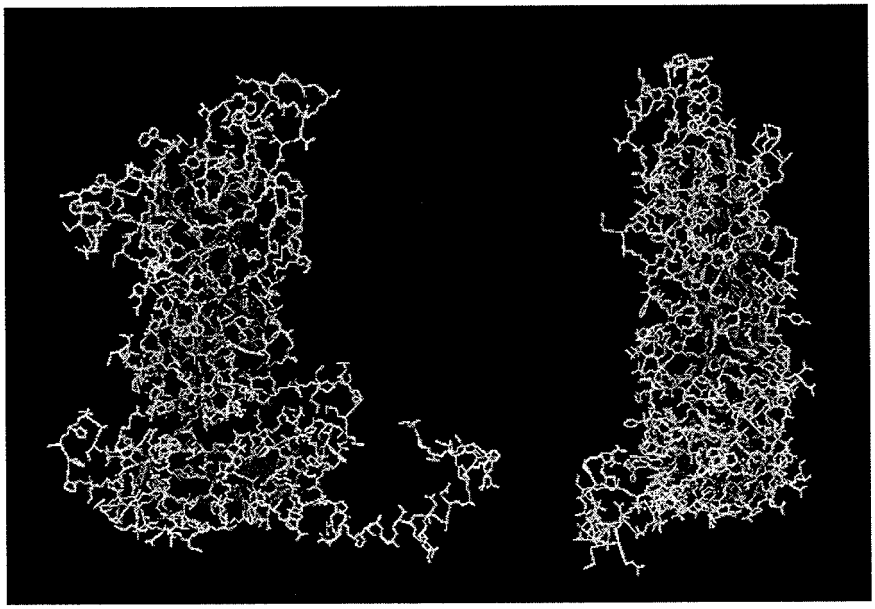


FIGURE 4

A

M E G N G L P Q A G Q Q Q A L D V P G T T G P T S S A V V V A N P
D Q P S A Q A Q R M E L A V A T G A V S S N V P D A V R Q C F A L
L R T F P W N T R Q A T G T Y L G S A A L S P A L N P Y T A H L S
A M W A G W G G S M E A R V T I S G S G T F A G K I I V A L L P P
G L D P T R V R D P G V L P H A Q V D A R A V D P I T F N I N D V
R A V D Y H R T D G Q E A T S T L G F W V L Q P L I N P F S H D A
L S T A W V S V E T R P G P D F D F C L L K P P Q M E M E N G L S
P S T L L P R H L G R S R G N R C G G F I V G M A V V A M A H Q V
N H H F S T A A T T Y G W S T L P L G P C A A K I T S S L P G **E I**
N N Y T G F A D V D G A G E G P I M P N I P N H W P D S C **A S S V**
I A T W D S S L H R P N L G I S G S I M T F D N **H G D A D E A Q I**
T G A M A A T V D P **S P S R** R T Q L Q G S F T A **N T M R I M R** T S
G L D K I G E **V N K N V Y F** I P I **L L D G A T G Y I N E K V T N L**
A D I N I S Y G P V G S N N V I L W R E R V F S S H P R P G I L Y
S S Q L E S T A S I F Q D G P V N I P N N Y M A V F N V S D T G A
D F Q I G I C P D G Y M R T G S P V G T V V D L T P E C T F T F V
G L F P F T S P L N G P H G T G R G R S V Y Q **(SEQ ID NO: 3)**

B

M E G N G L P Q A G Q Q Q A L D V P G T T G P T S S A V V V A N P
D Q P S A Q A Q R M E L A V A T G A V S S N V P D A V R Q C F A L
L R T F P W N T R Q A T G T Y L G S A A L S P A L N P Y T A H L S
A M W A G W G G S M E A R V T I S G S G T F A G K I I V A L L P P
G L D P T R V R D P G V L P H A Q V D A R A V D P I T F N I N D V
R A V D Y H R T D G Q E A T S T L G F W V L Q P L I N P F S H D A
L S T A W V S V E T R P G P D F D F C L L K P P Q M E M E N G L S
P S T L L P R H L G R S R G N R C G G F I V G M A V V A M A H Q V
N H H F S T A A T T Y G W S T L **P L G P C A A K I T S S L P G E I**
N N Y T G F **A D V D** G A G E G **P I M P N** I P N H W P D S C **A S S V**
I A T W D S S L H R P N L G I S G S **I M T F D N** H G D A D E A Q I
T **G A M A A T V D P S P S R R T Q L Q G S F T A N T** M R I M R T **S**
G L D K I G E V N K N V Y F I P I L L D G A T G **Y I N E** K V T N L
A D I N I S Y G P V G S N N V I L W R E R V F S S H P R P G I L Y
S S Q L E S T A S I F Q D G P V N I P N N Y M A V F N V S D T G A
D F Q I G I C P D G Y M R T G S P V G T V V D L T P E C T F T F V
G L F P F T S P L N G P H G T G R G R S V Y Q **(SEQ ID NO: 3)**

FIGURE 5

```
Norwalk   MMMASKDATSSVDGASGAGQLVPEVNASDPLAMDPVAGSSTAVATAGQVNPIDPWIINNF
SMSV      -----------SDGPGSAEIVTEEQGTVVQQQPAPAPTALATLATASTGKSVEQEWMTFF
                     **...*  :. * .:       *.. : :::***.  :.::   :. *

Norwalk   VQAPQGEFTISPNNTPGDVLFDLSLGPHLNPFLLHLSQMYNGWVGNMRVRIMLAGNAFTA
SMSV      SYHTSINWSTVE--SQGKILYSQALNPSINPYLDHIAKLYSTWSGGIDVRFTVSGSGVFG
             .. :::     : *.:*:. :*.* :**:* *::::*. * *.: **: ::*... .

Norwalk   GKIIVSCIPPGFGSHNLTIAQATLFPHVIADVRTLDPIEVPLEDVRNVLFHNNDRNQQTM
SMSV      GKLAALLVPP--GVEPIESVSMLQYPHVLFDARQTEPVIFTIPDIRKTLFHSMDET-DTT
          **: .  :**  * . :  ..   :***: *.*  :*: ..: *:*:.***. *.. :*

Norwalk   RLVCMLYTPLR--TGGGTGDSFVVAGRVMTCPSPDFNFLFLVPP--TVEQKTRPFTLPNL
SMSV      KLVIMVYNELINPYENGVENKTTCSITVETRPSADFTFALLKPPGSLIKHGSIPSDLIPR
          :** *:*. *     .*. :. . :  * * **.**.* :* **   ::: : *  *

Norwalk   PLSSLSNSRAPLPISSMGISPDNVQS-VQFQNGRCTLDGRLVGTTPVSLSHVAKIRGTSN
SMSV      NSAHWMGNRWWSTISGFSVQPRVFQSNRHFDFDSTTTGWSTPYYVPIEIKIQGKVGSNNK
            :   ..*   .**.:.:.*  .**  :*: .  * .      .*:.:.  .*: ...:

Norwalk   GTVINLTELDGTPFHPFEGPAPIGFPDLGGCDWHINMTQFGHSSQTQYDVDTTPDTFVPH
SMSV      WFHVIDTDKALVPGIPDGWPDTTIPDETKATNGNFSYGESYRAGSTTIKPNENSTHFKGT
             :  *:   .*  *   * .    :  . : ::.  :  ::..*  . : ..  *

Norwalk   LGSIQANGIGSGN--------------------YVGVLSWISPPSHPSGSQVDLWKIPNY
SMSV      YICGTLSTVEIPENDEQQIKTEAEKKSQTMYVVTADFKDTIVKPQHKISPQKLVVYFDGP
            .   . :   :                        ... . *  *.*  ..*  :  : .

Norwalk   GSSITEATHLAPS----VYPPGFGEVLVFFMSKMPGPGAYNLPCLLPQEYISHLASEQAP
SMSV      EKDLTMSATLSPLGYTLVDEQPVGSVSSRVVRIATLPEAFTQGGNYPIFYVNKIKVGYFD
           ..:* :: *:*     *    .*.*   .:   . * *:.     *  *:.::

Norwalk   TVGEAALLHYVDPDTGRNLG-EFKAYPDGFLTCVPNGASSGPQQLPINGVFVFVSWVSRF
SMSV      RATTNCYNSQILMTSQRLAEGNYNLPPDSLAVYRITDSSSQWFDIGINHDGFSYVGLSDL
           .   .    :   : *    :::  **.: .   ..:**   :: **   .    :* :

Norwalk   YQLKPVGTASSARGRLGLRR-------------- (SEQ ID NO: 1)
SMSV      PNDLSFPLTSTFMGVQLARVKLASKVKAHTITAK (SEQ ID NO: 4)
```

FIGURE 6

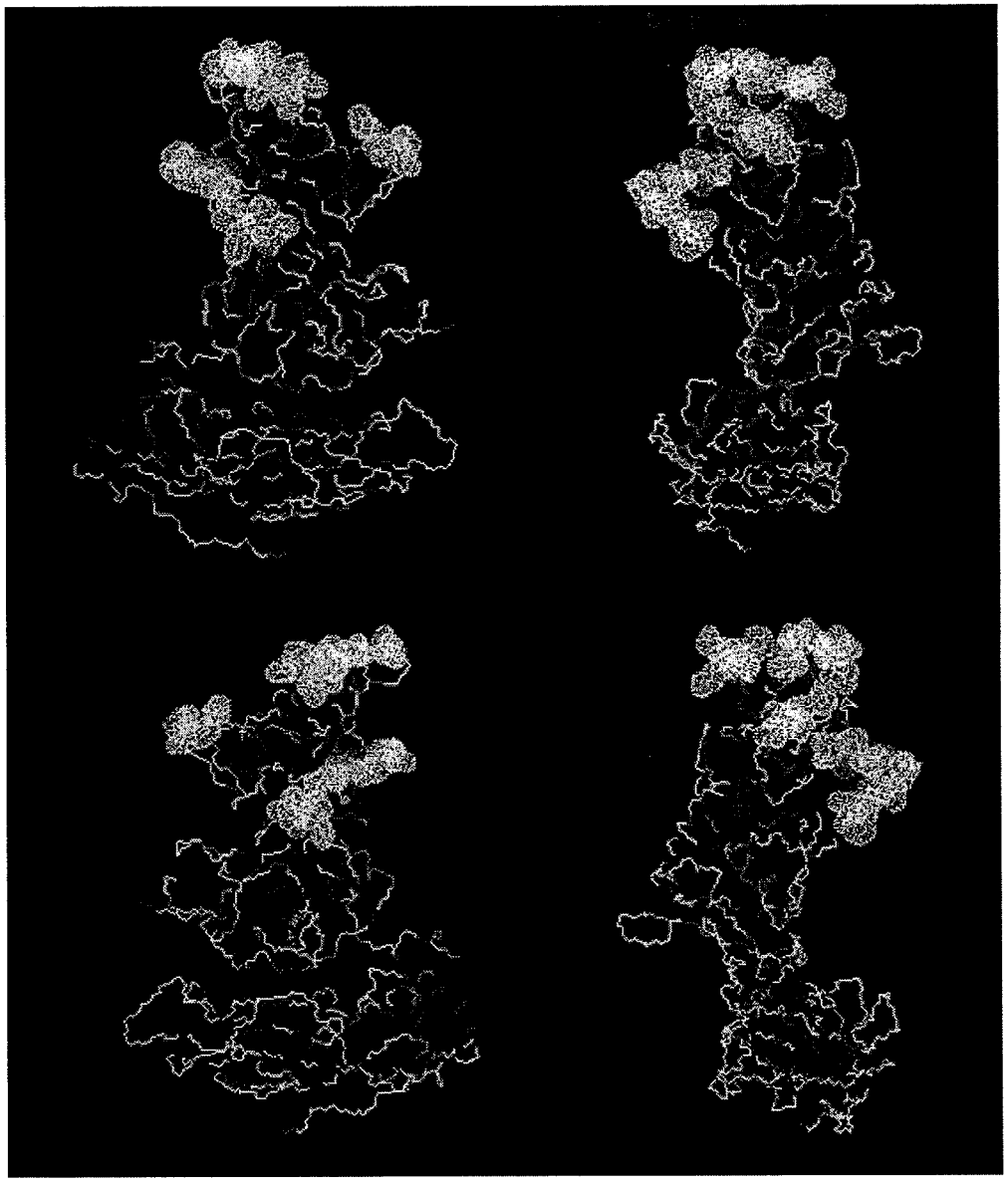


FIGURE 7

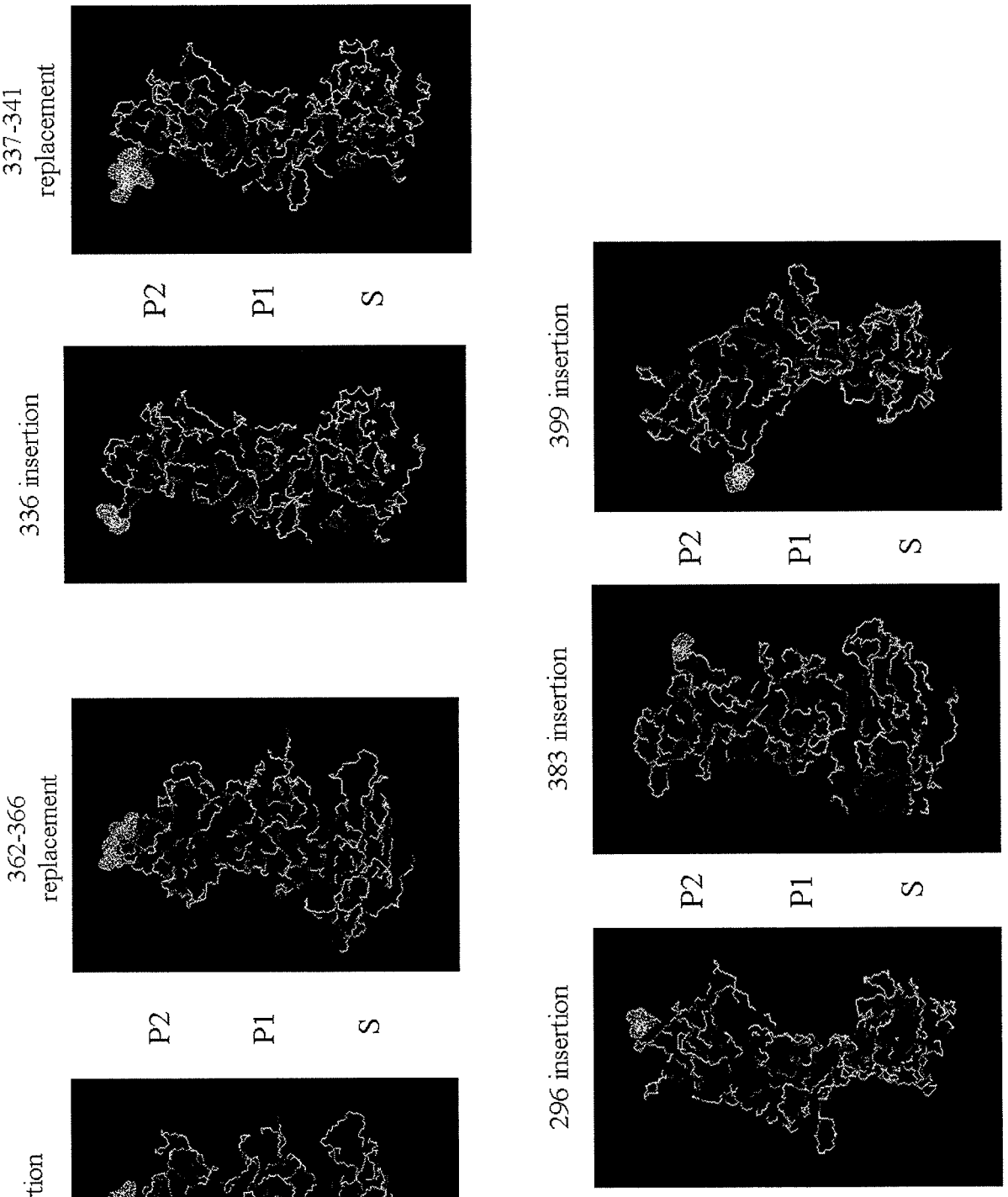

362 insertion
362-366 replacement
336 insertion
337-341 replacement
296 insertion
383 insertion
399 insertion
P2
P1
S

FIGURE 8

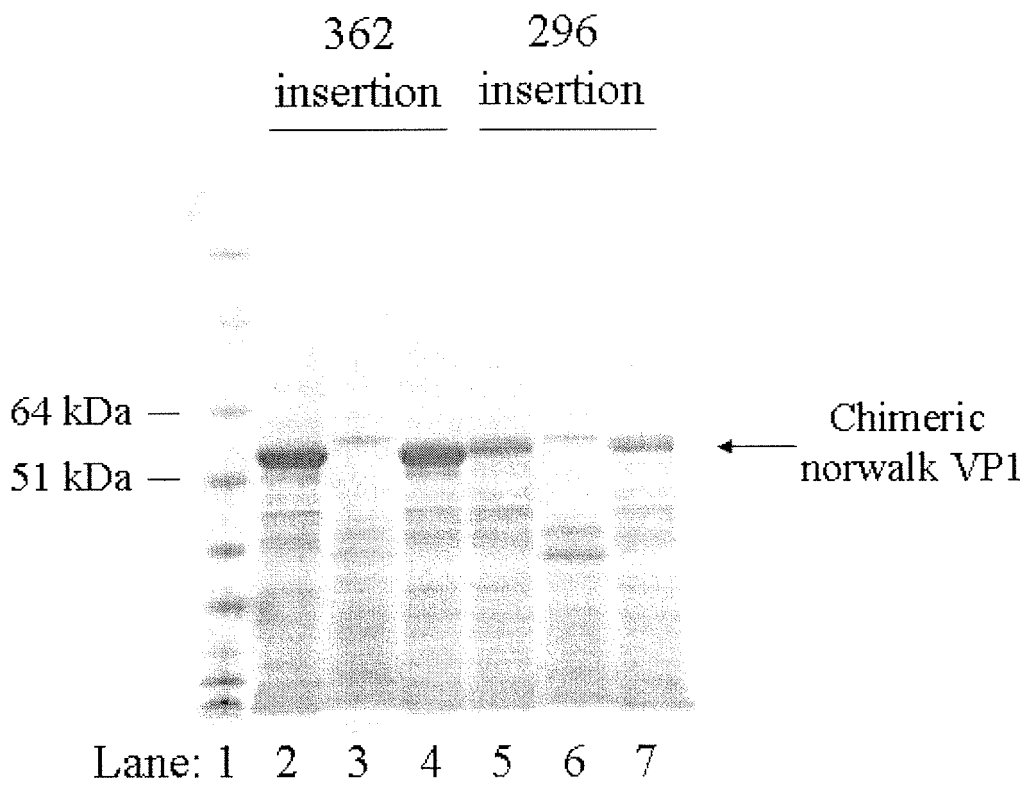
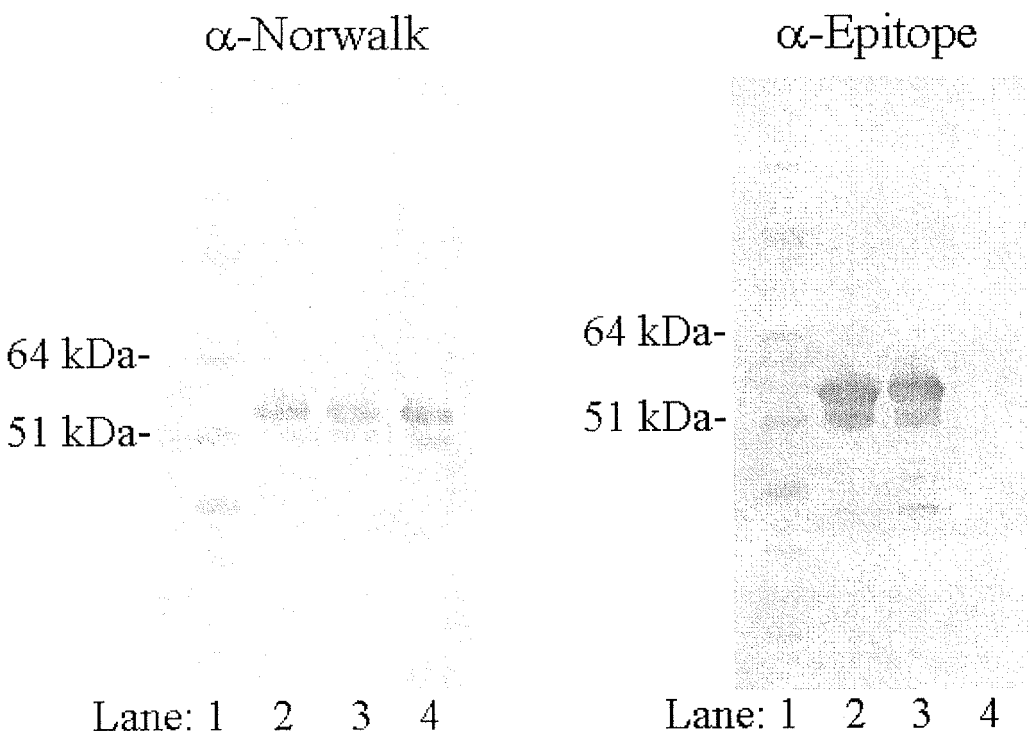

362 insertion
296 insertion
64 kDa
51 kDa
Chimeric norwalk VP1
Lane: 1 2 3 4 5 6 7

FIGURE 9


α-Norwalk
α-Epitope
64 kDa-
51 kDa-
64 kDa-
51 kDa-
Lane: 1 2 3 4
Lane: 1 2 3 4

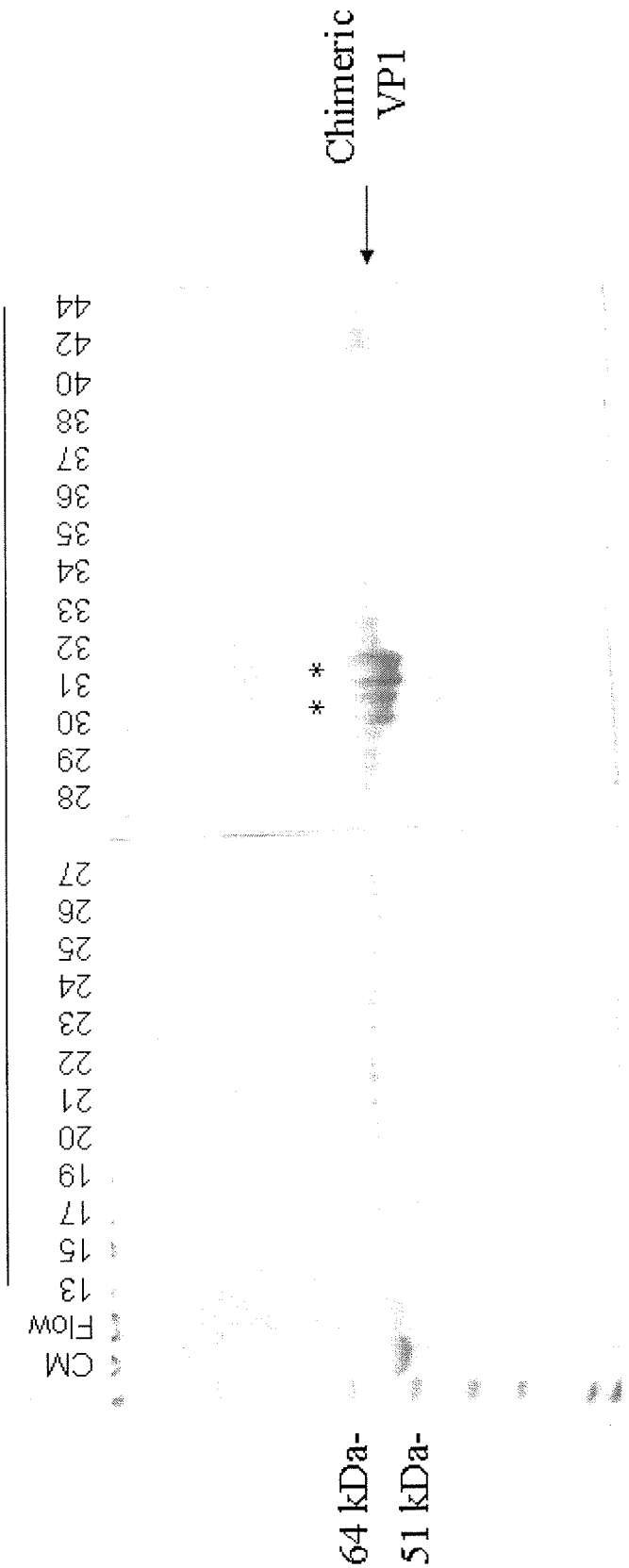
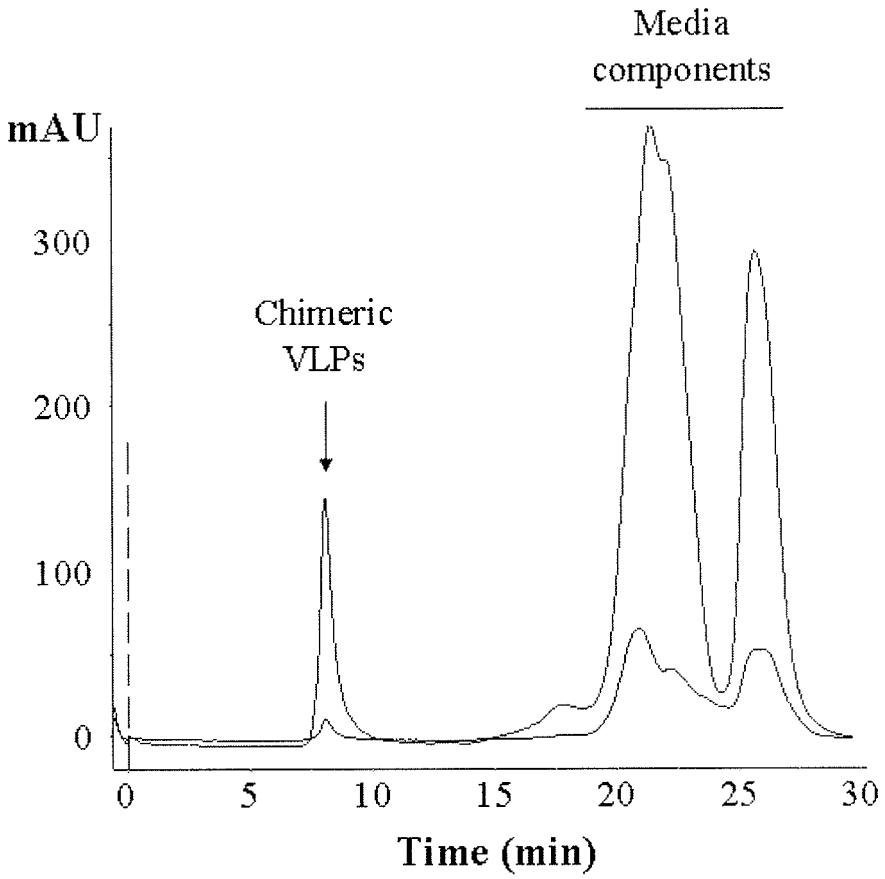

Chimeric VP1
CFC sucrose gradient fractions
CM
Flow
13
15
17
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
40
42
44
64 kDa-
51 kDa-

FIGURE 10

FIGURE 11


Media components
mAU
300
200
100
0
Chimeric VLPs
0
5
10
15
20
25
30
Time (min)

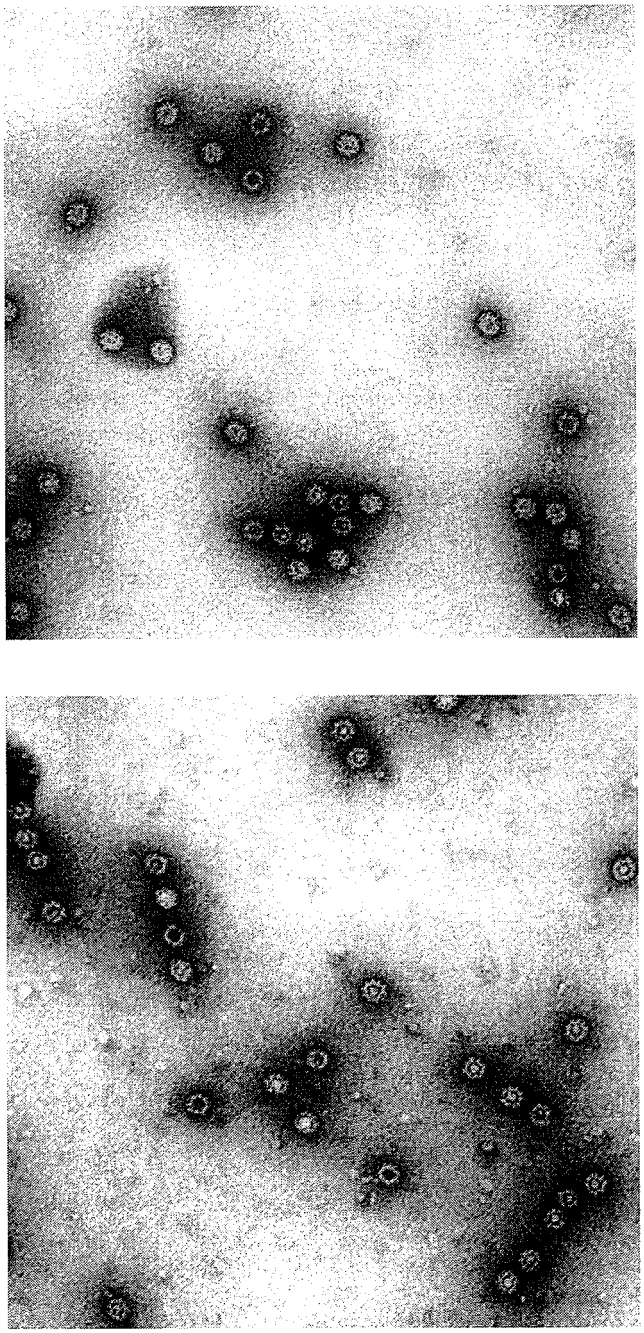


FIGURE 12

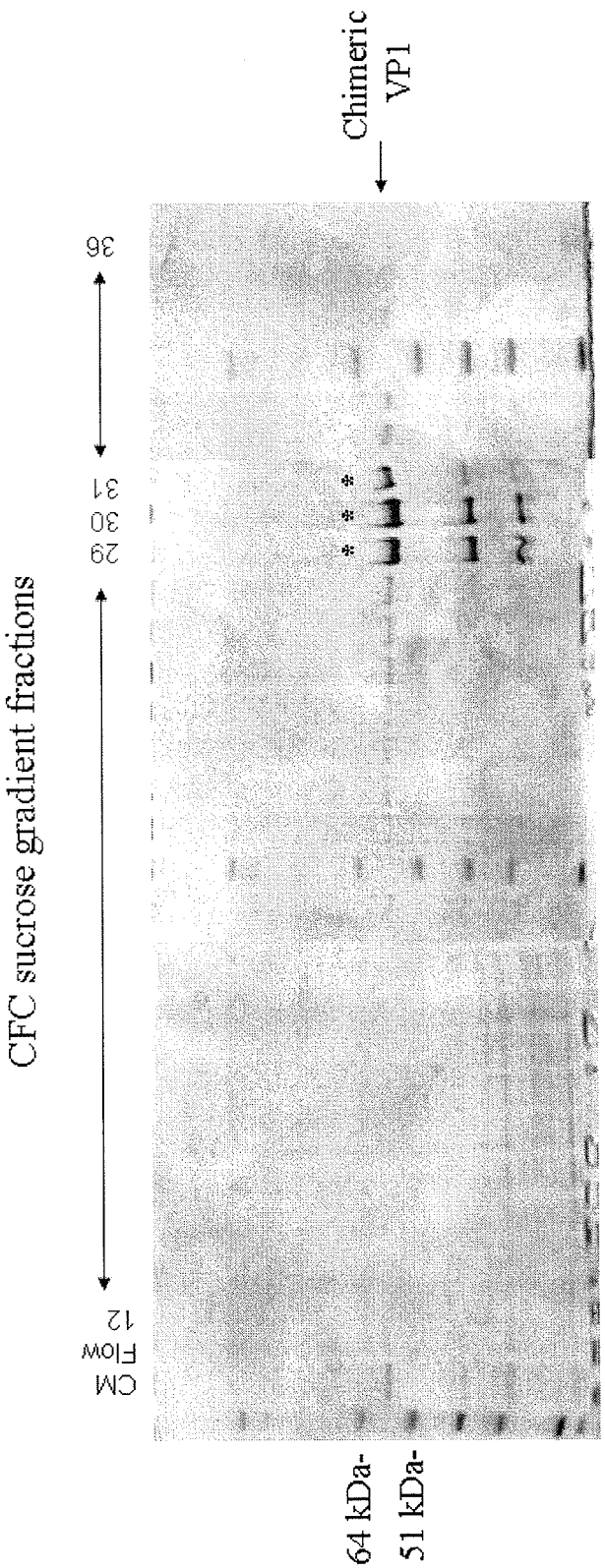
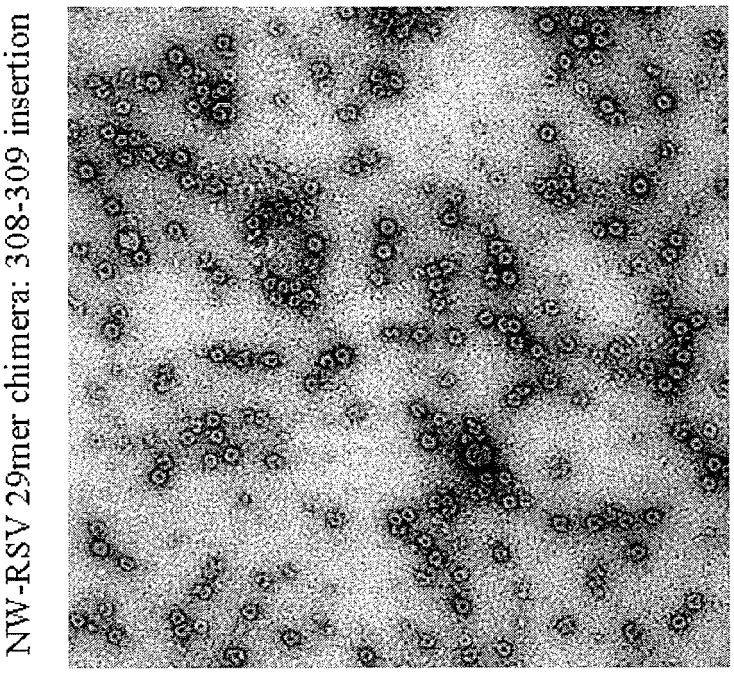

Chimeric VP1
64 kDa-
51 kDa-
CM Flow
12
CFC sucrose gradient fractions
29
30
31
36

FIGURE 13



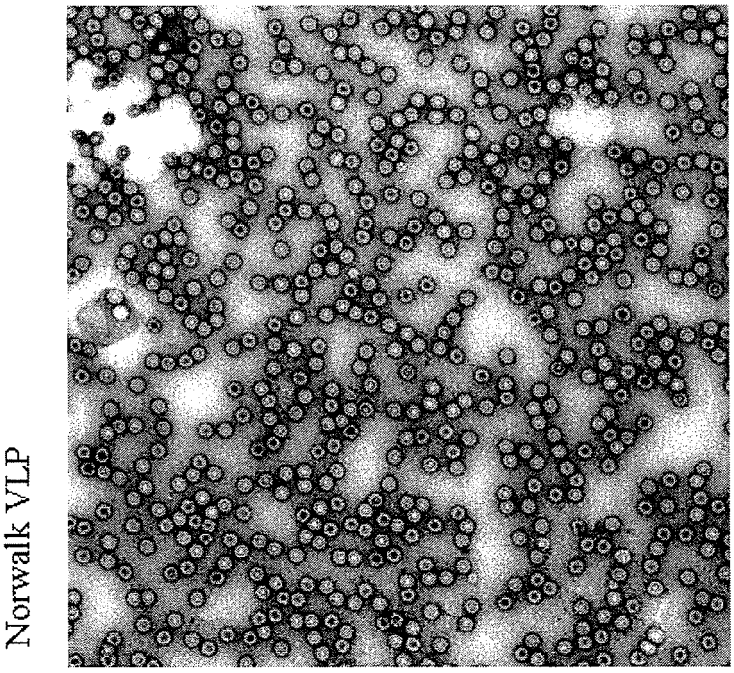


FIGURE 14

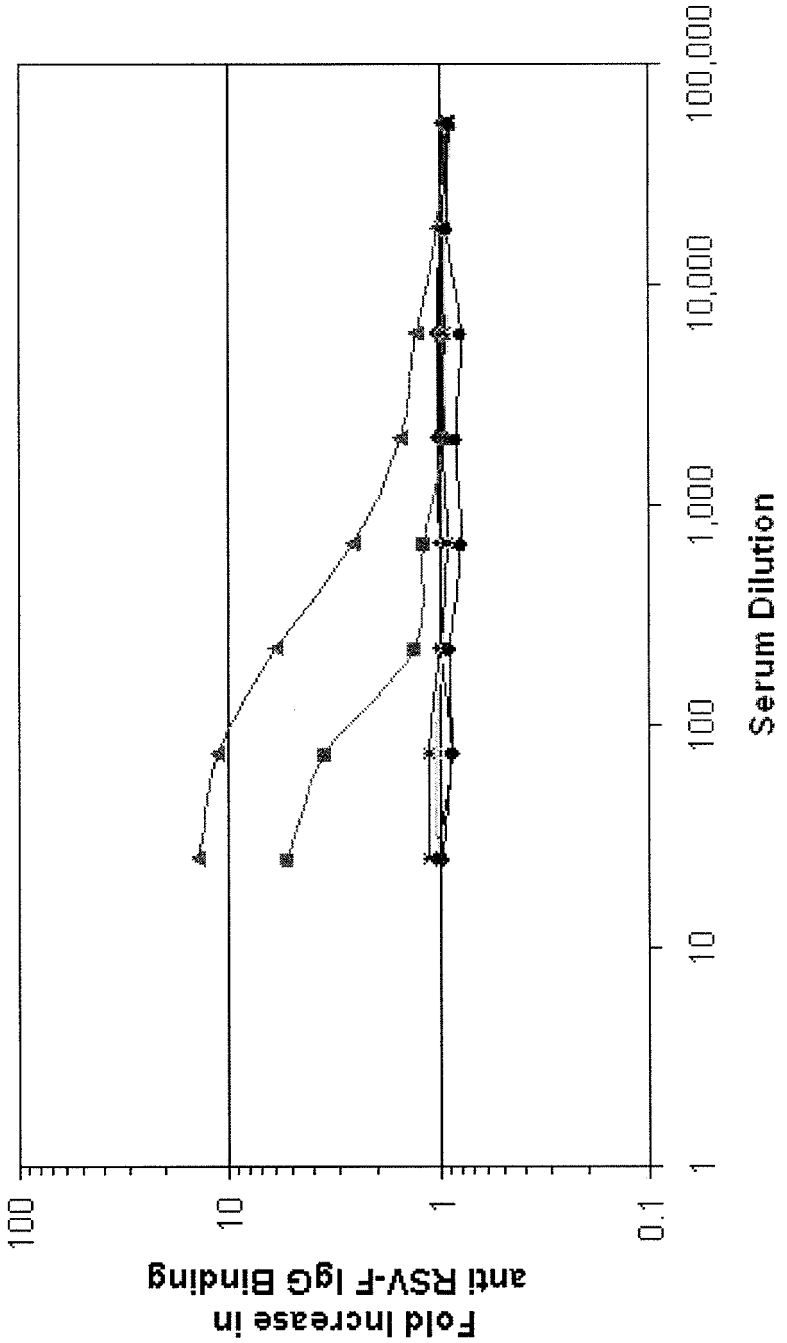

Fold Increase in
anti RSV-F IgG Binding
100
10
1
0.1
1
10
100
1,000
10,000
100,000
Serum Dilution

FIGURE 15

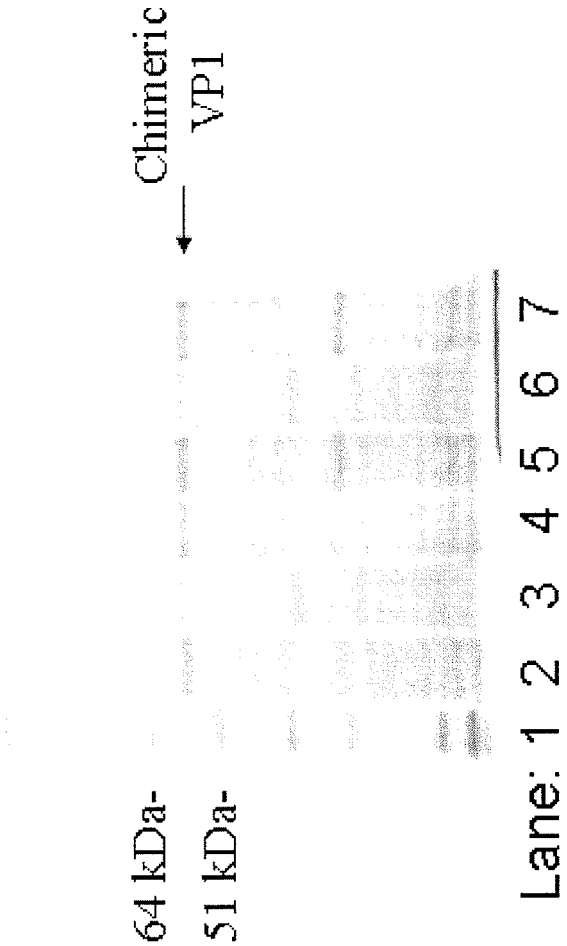


FIGURE 16

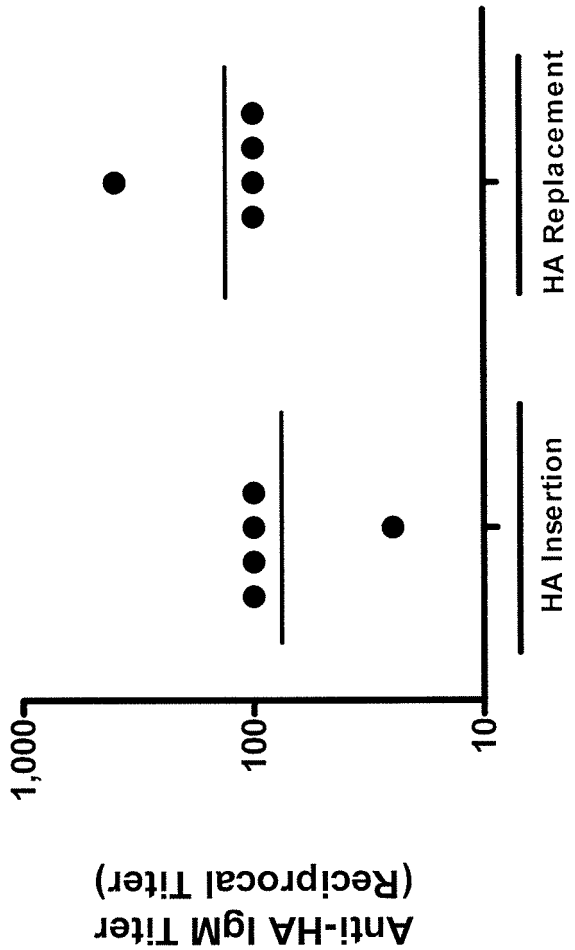

Anti-HA IgM Titer
(Reciprocal Titer)
1,000
100
10
HA Insertion
HA Replacement

FIGURE 17

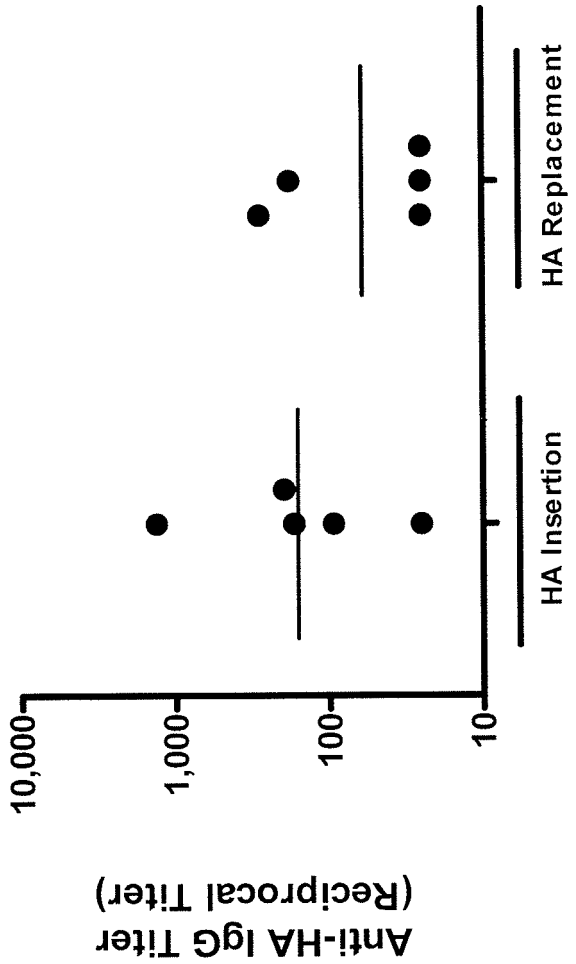

Anti-HA IgG Titer
(Reciprocal Titer)
10,000
1,000
100
10
HA Insertion
HA Replacement

FIGURE 18