FIG. 1

Original TNF-alpha sequence

RTPSDKPVAHVVANPQAEGQLQWLNRRANALLANGVELRDNQLVVPSEGL
YLIYSQVLFKGQGCPSTHVLLTHTISRIAVSYQTKVNLLSAIKSPCQRET
PEGAEAKPWYEPIYLGGVFQLEKGDRLSAEINRPDYLDFAESGQVYFGII
AL (SEQ ID NO: 18)

Modified TNF-alpha sequence inserted into CHIKV

SGGKPVAHVVANPQAEGQLQWLNRRANALLANGVELRDNQLVVPSEGLYL
IYSQVLFKGQGCPSTHVLLTHTISRIAVSYQTKVNLLSAIKSPCQRETPE
GAEAKPWYEPIYLGGVFQLEKGDRLSAEINRPDYLDFAESGQVYFGIIAL
TRGGS (SEQ ID NO: 19)

Nucleotide sequence encoding the modified TNF-alpha

tccggaggtaagcctgtagcccatgttgtagcaaaccctcaagctgaggg
gcagctccagtggctgaaccgccgggccaatgccctcctggccaatggcg
tggagctgagagataaccagctggtggtgccatcagagggcctgtacctc
atctactcccaggtcctcttcaagggccaaggctgcccctccacccatgt
gctcctcacccacaccatcagccgcatcgccgtctcctaccagaccaagg
tcaacctcctctctgccatcaagagcccctgccagagggagaccccagag
ggggctgaggccaagccctggtatgagcccatctatctgggaggggtctt
ccagctggagaagggtgaccgactcagcgctgagatcaatcggcccgact
atctcgactttgccgagtctgggcaggtctactttgggatcattgccctg
acgcgtggaggatcc (SEQ ID NO: 20)

Fig.2

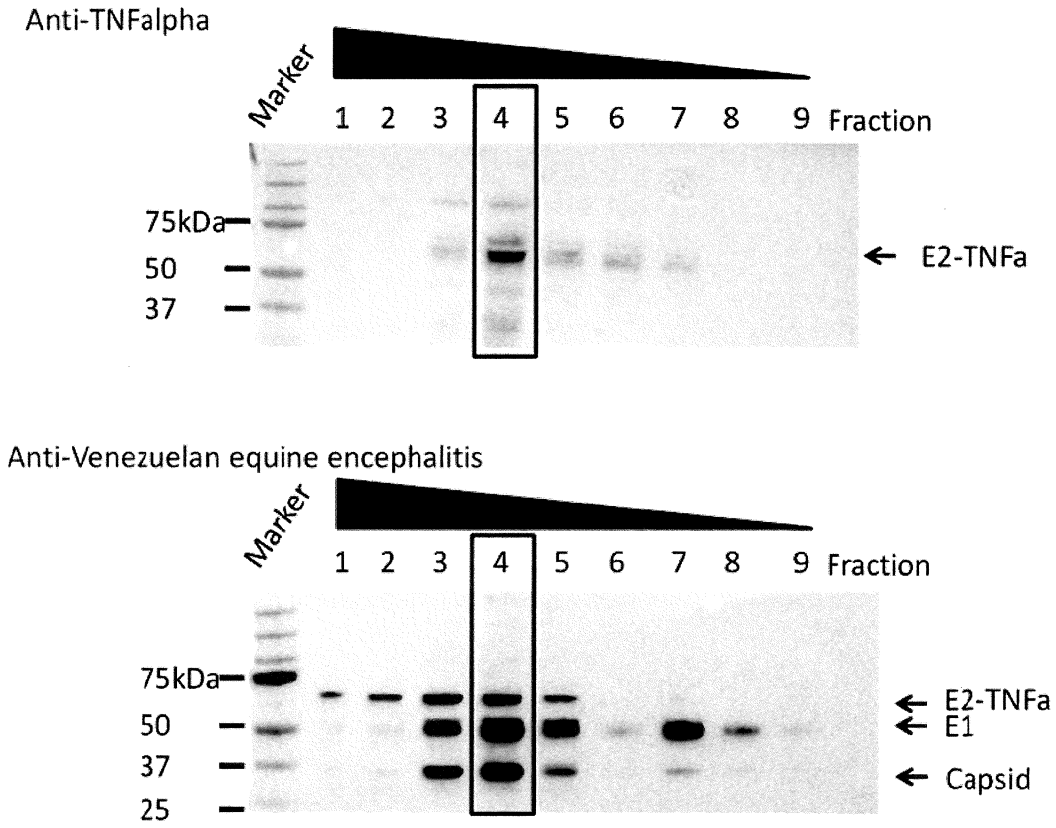

Anti-TNFalpha
Marker
1 2 3 4 5 6 7 8 9 Fraction
75kDa
50
37
E2-TNFa
Anti-Venezuelan equine encephalitis
Marker
1 2 3 4 5 6 7 8 9 Fraction
75kDa
50
37
25
E2-TNFa
E1
Capsid

Fig.3

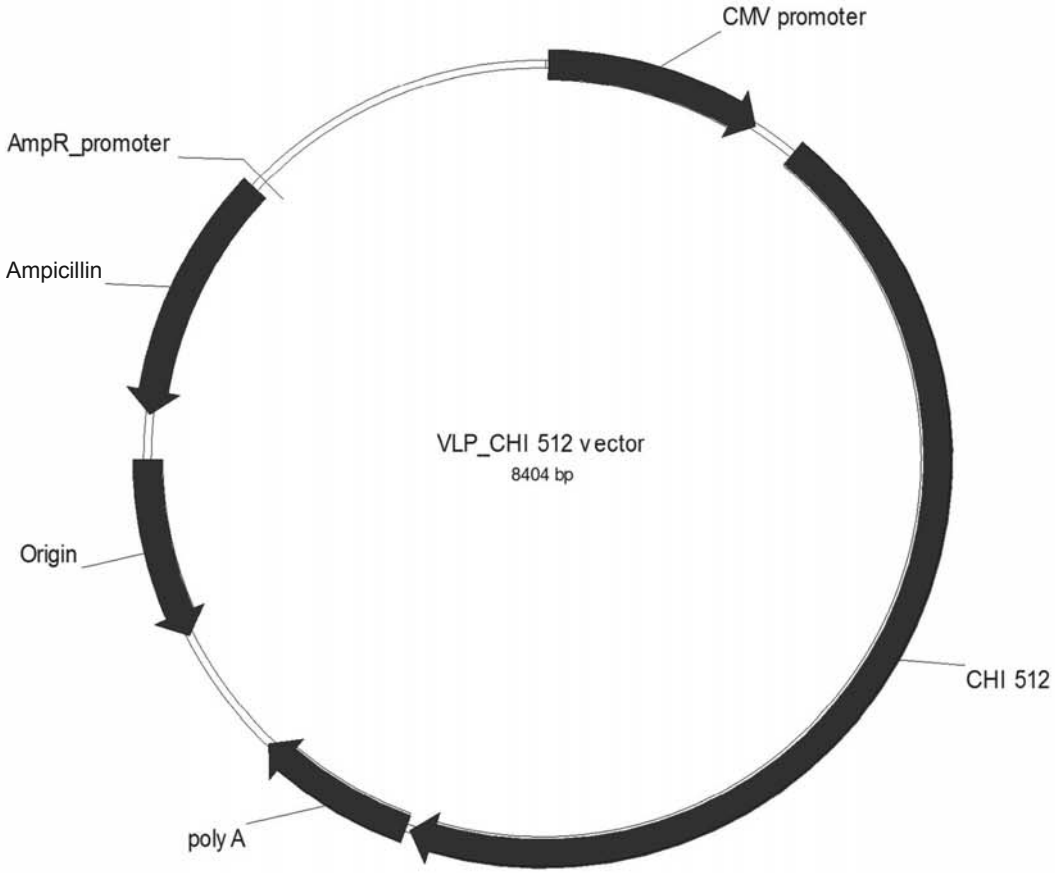

CMV promoter
AmpR_promoter
Ampicillin
VLP_CHI 512 vector
8404 bp
Origin
CHI 512
poly A

Fig.4

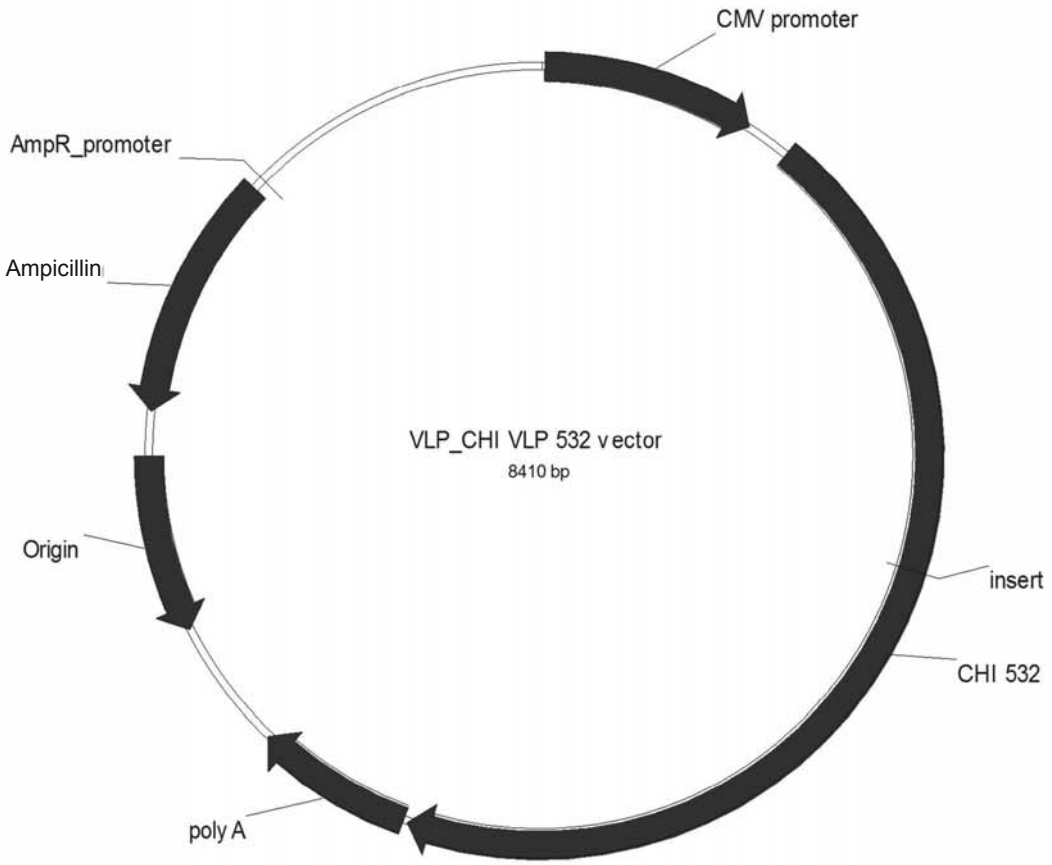

CMV promoter
AmpR_promoter
Ampicillin
VLP_CHI VLP 532 vector
8410 bp
Origin
insert
CHI 532
poly A

Fig.5

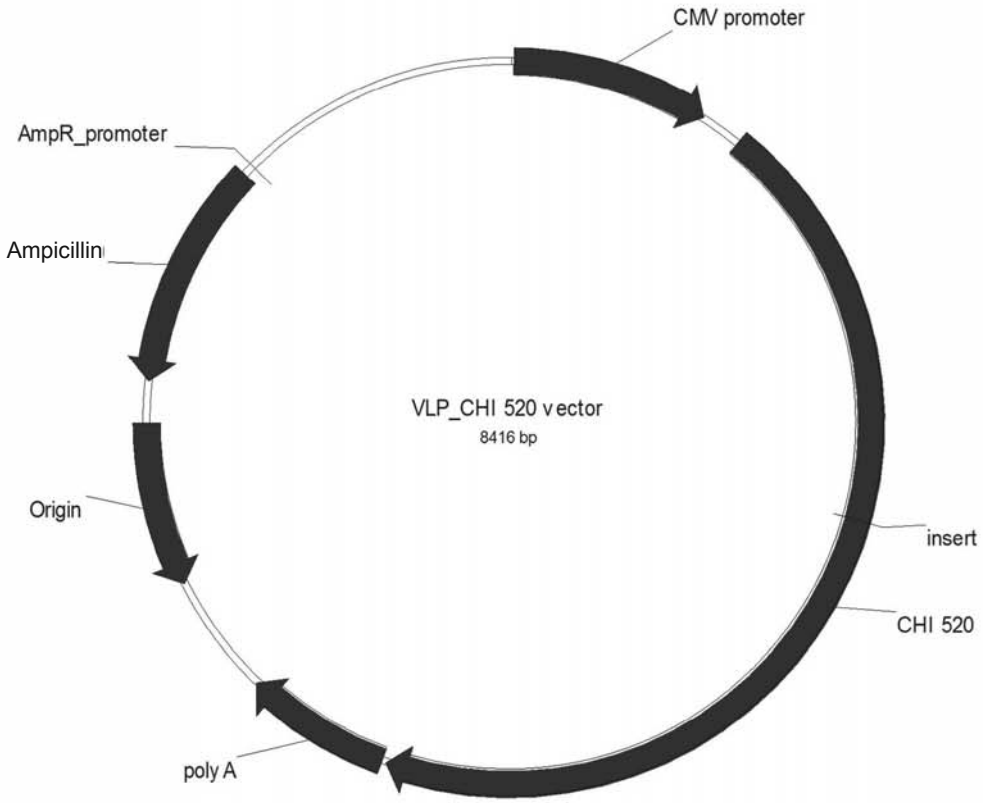

CMV promoter
AmpR_promoter
Ampicillin
VLP_CHI 520 vector
8416 bp
Origin
insert
CHI 520
poly A

Fig. 6

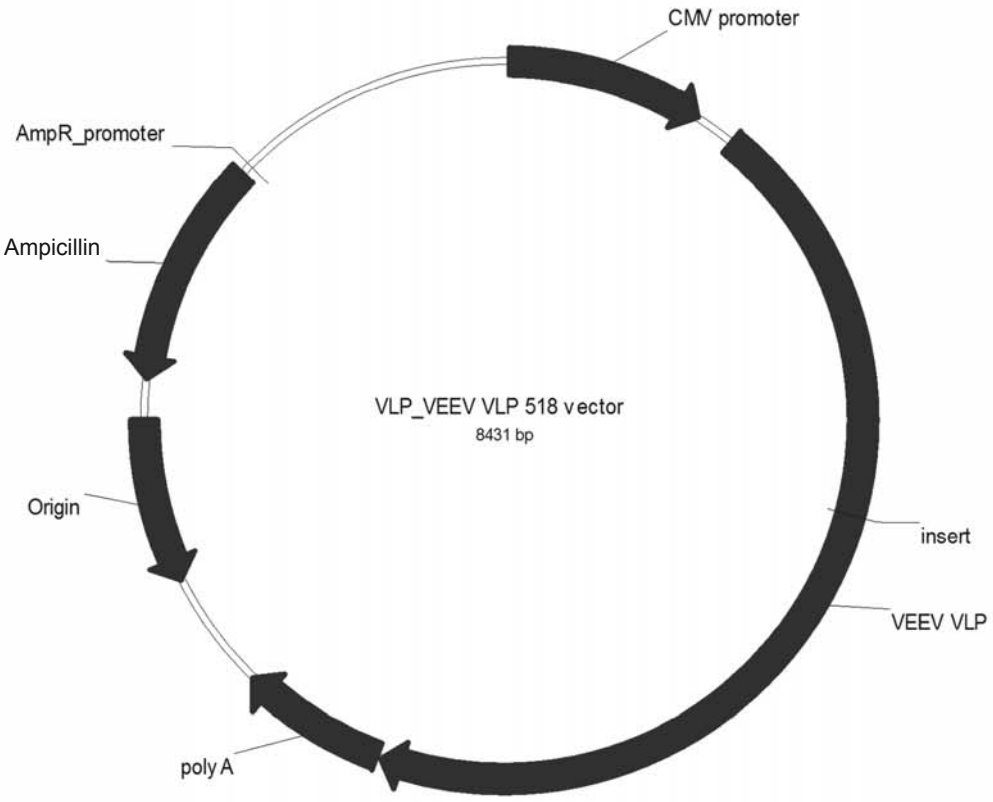

CMV promoter
AmpR_promoter
Ampicillin
VLP_VEEV VLP 518 vector
8431 bp
Origin
insert
VEEV VLP
poly A

Fig.7

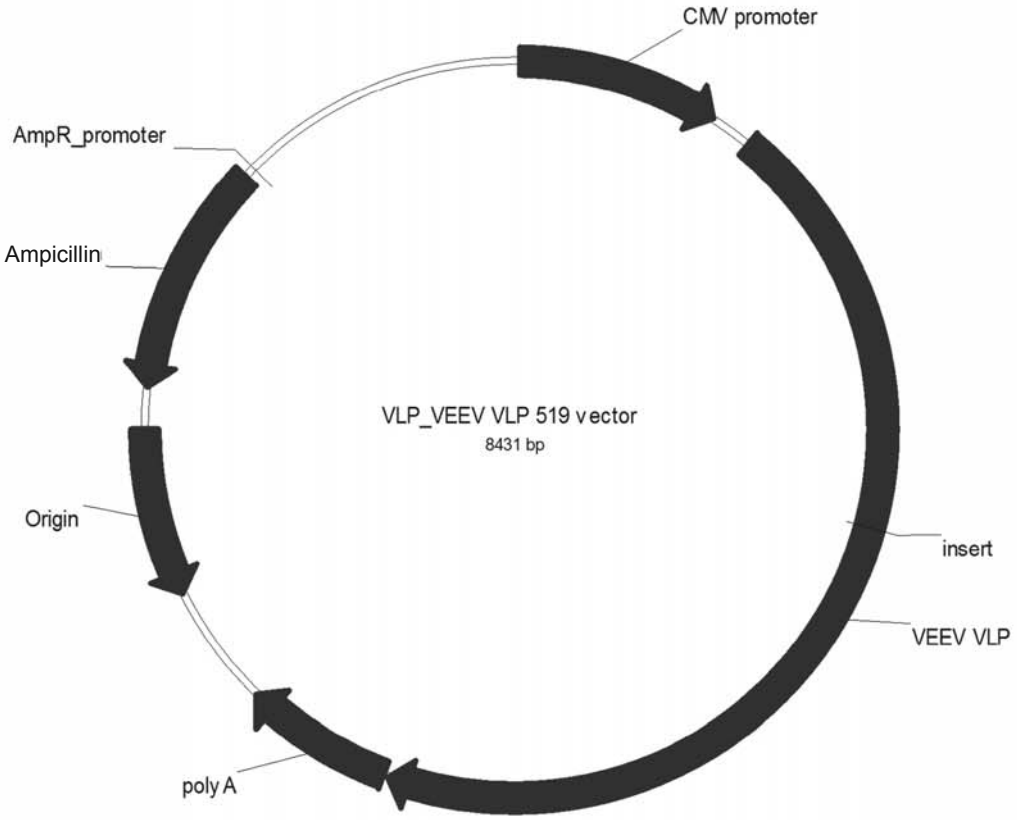

CMV promoter
AmpR_promoter
Ampicillin
VLP_VEEV VLP 519 vector
8431 bp
Origin
insert
VEEV VLP
poly A

Fig.8

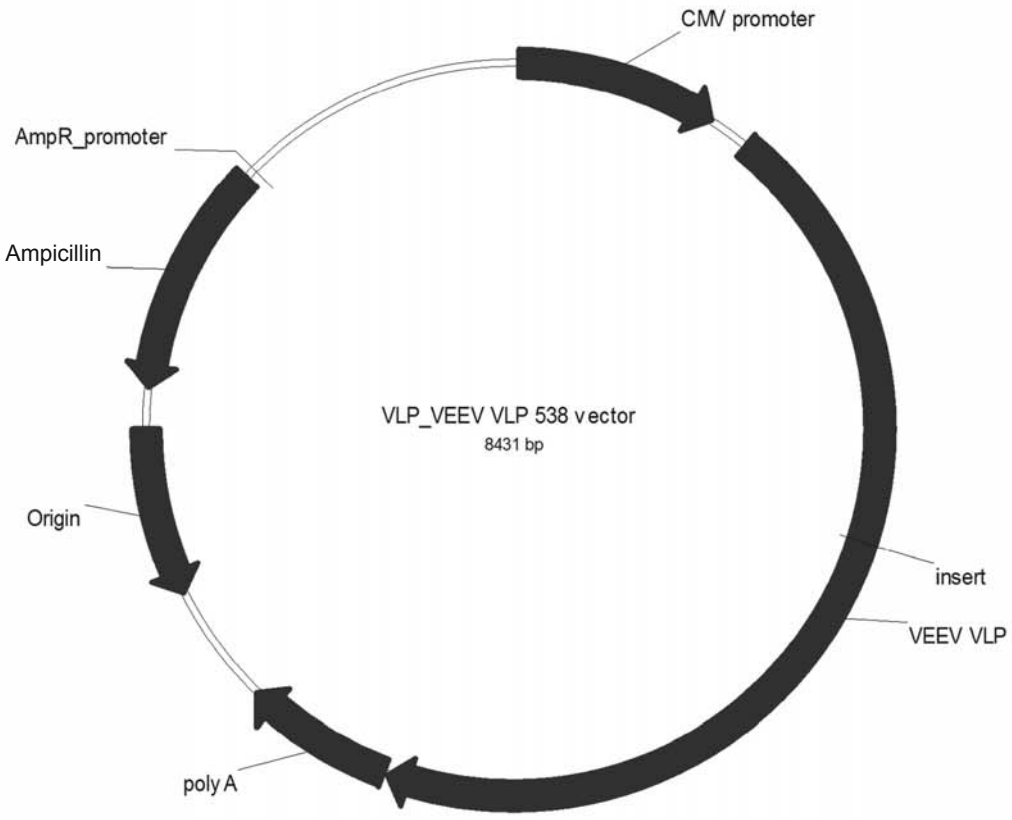

CMV promoter
AmpR_promoter
Ampicillin
VLP_VEEV VLP 538 vector
8431 bp
Origin
insert
VEEV VLP
poly A

Fig. 9

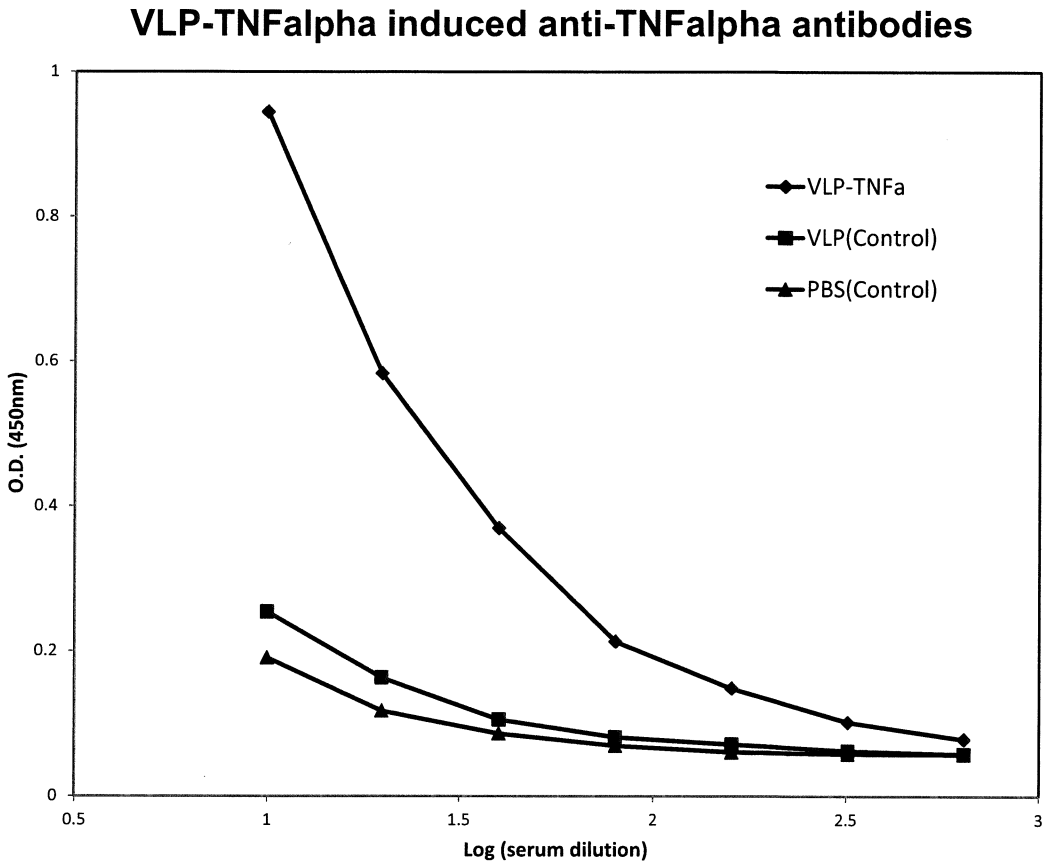

VLP-TNFalpha induced anti-TNFalpha antibodies
O.D. (450nm)
Log (serum dilution)
VLP-TNFa
VLP(Control)
PBS(Control)
0
0.2
0.4
0.6
0.8
1
0.5
1
1.5
2
2.5
3

Fig. 10

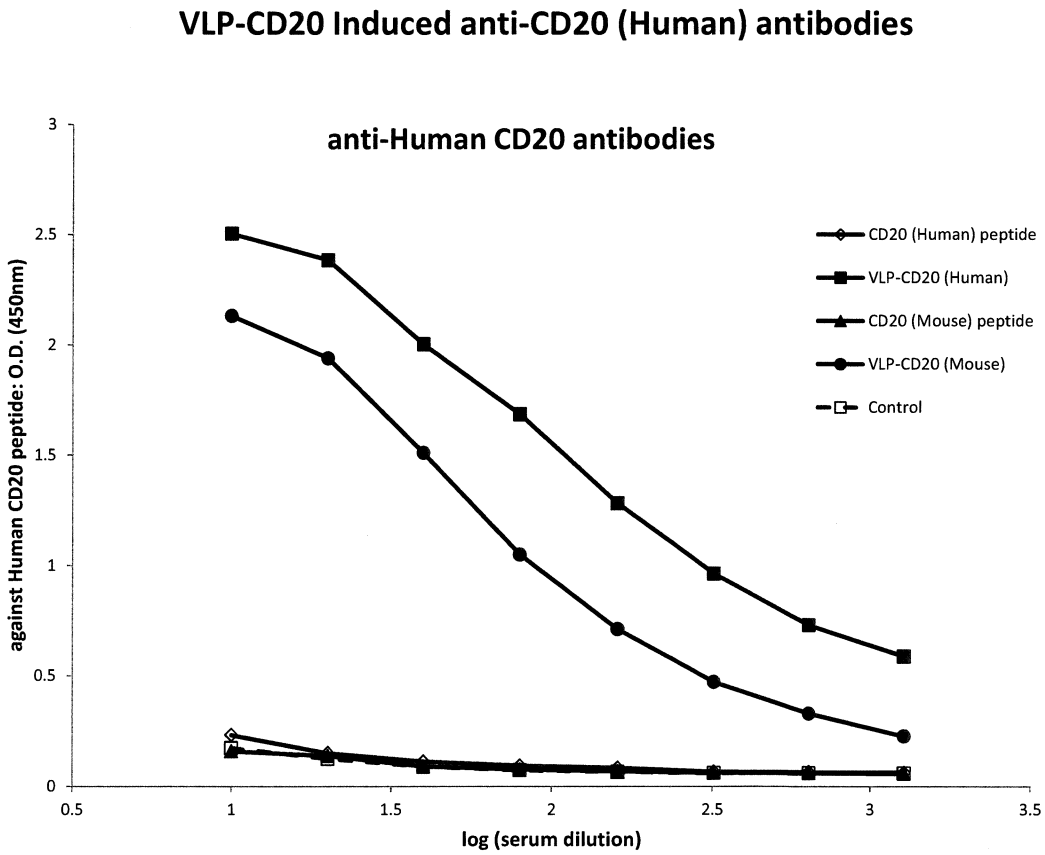
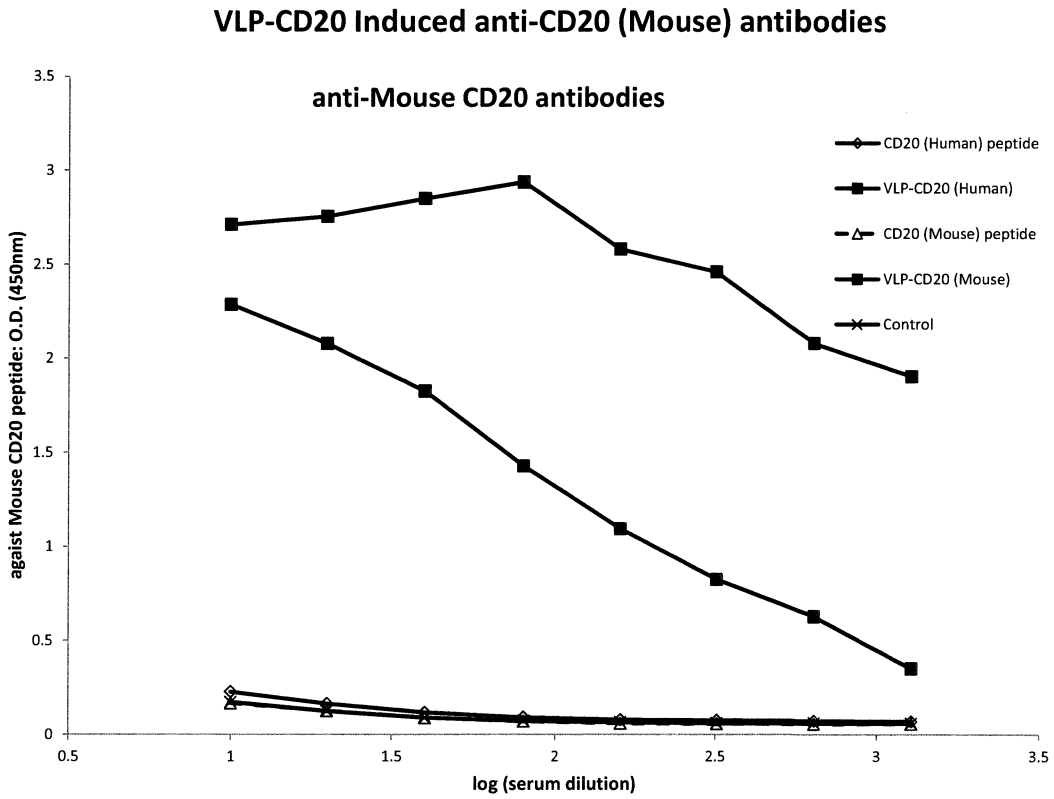

VLP-CD20 Induced anti-CD20 (Human) antibodies
anti-Human CD20 antibodies
against Human CD20 peptide: O.D. (450nm)
log (serum dilution)
CD20 (Human) peptide
VLP-CD20 (Human)
CD20 (Mouse) peptide
VLP-CD20 (Mouse)
Control
0
0.5
1
1.5
2
2.5
3
0.5
1
1.5
2
2.5
3
3.5

Fig.11


VLP-CD20 Induced anti-CD20 (Mouse) antibodies
anti-Mouse CD20 antibodies
agaist Mouse CD20 peptide: O.D. (450nm)
log (serum dilution)
CD20 (Human) peptide
VLP-CD20 (Human)
CD20 (Mouse) peptide
VLP-CD20 (Mouse)
Control
0
0.5
1
1.5
2
2.5
3
3.5