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.3

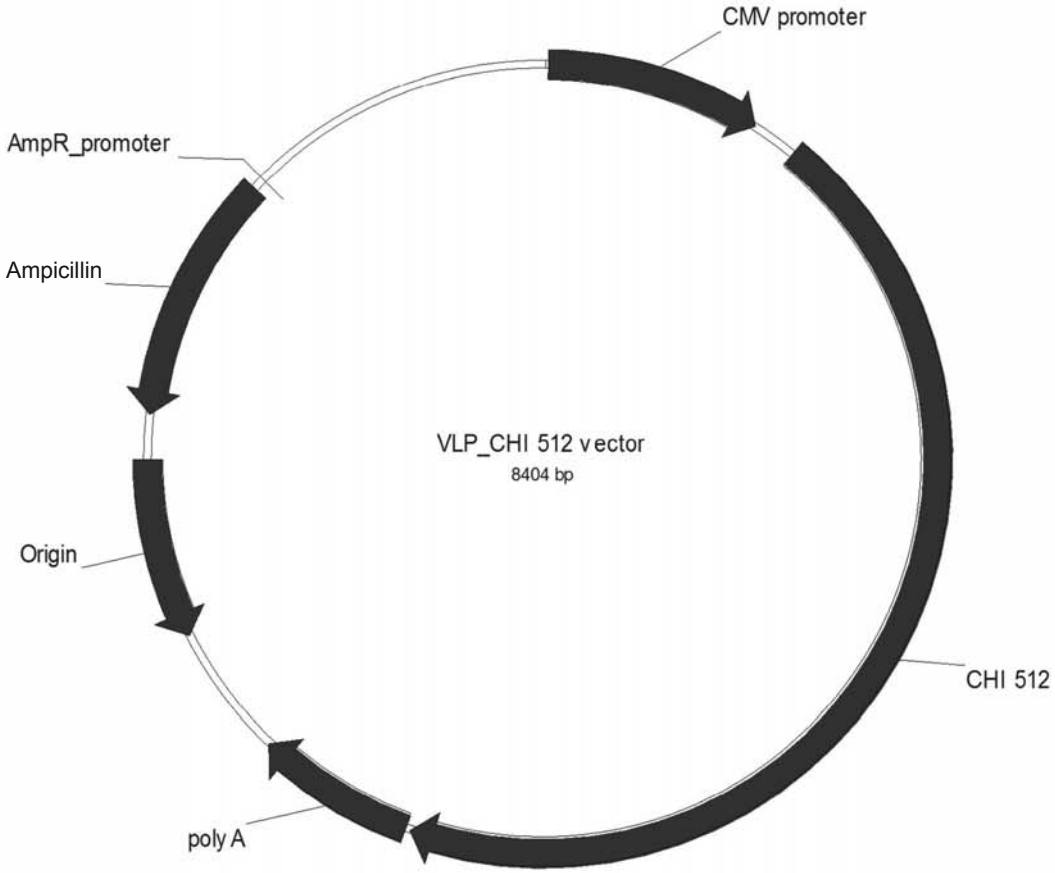

CMV promoter
AmpR_promoter
Ampicillin
VLP_CHI 512 vector
8404 bp
Origin
CHI 512
poly A

Fig.4

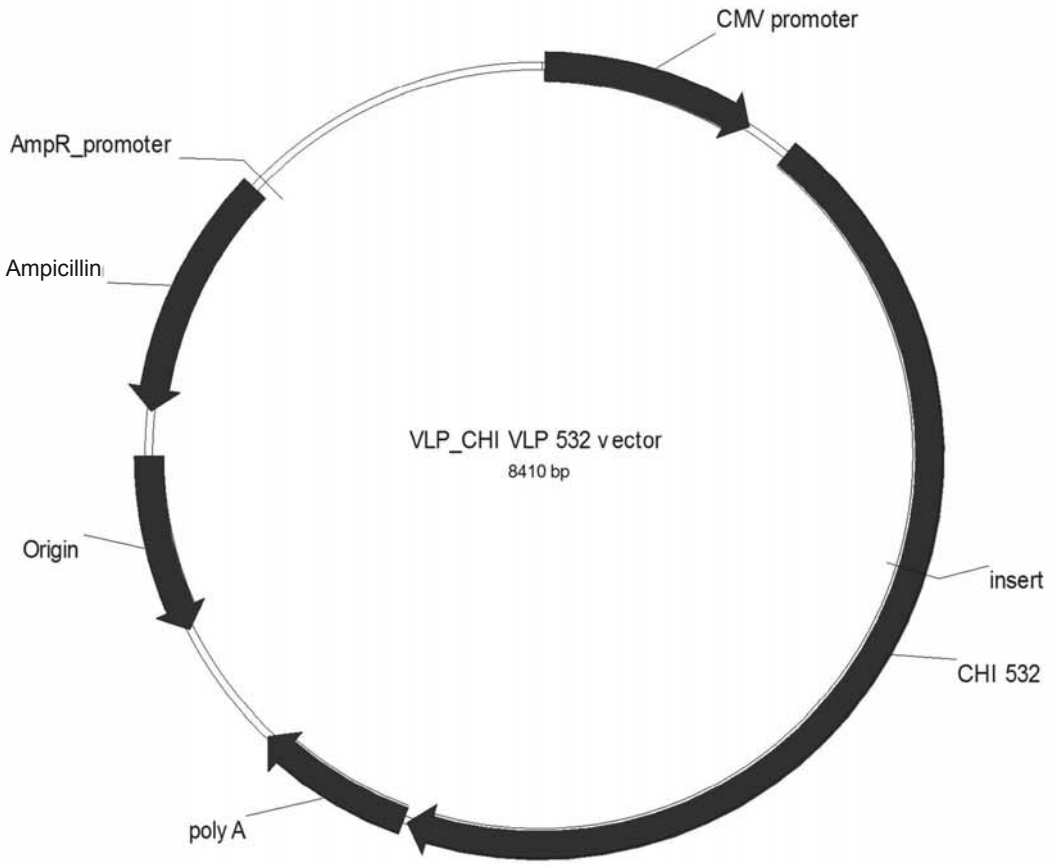

CMV promoter
AmpR_promoter
Ampicillin
VLP_CHI VLP 532 vector
8410 bp
Origin
insert
CHI 532
poly A

Fig.5

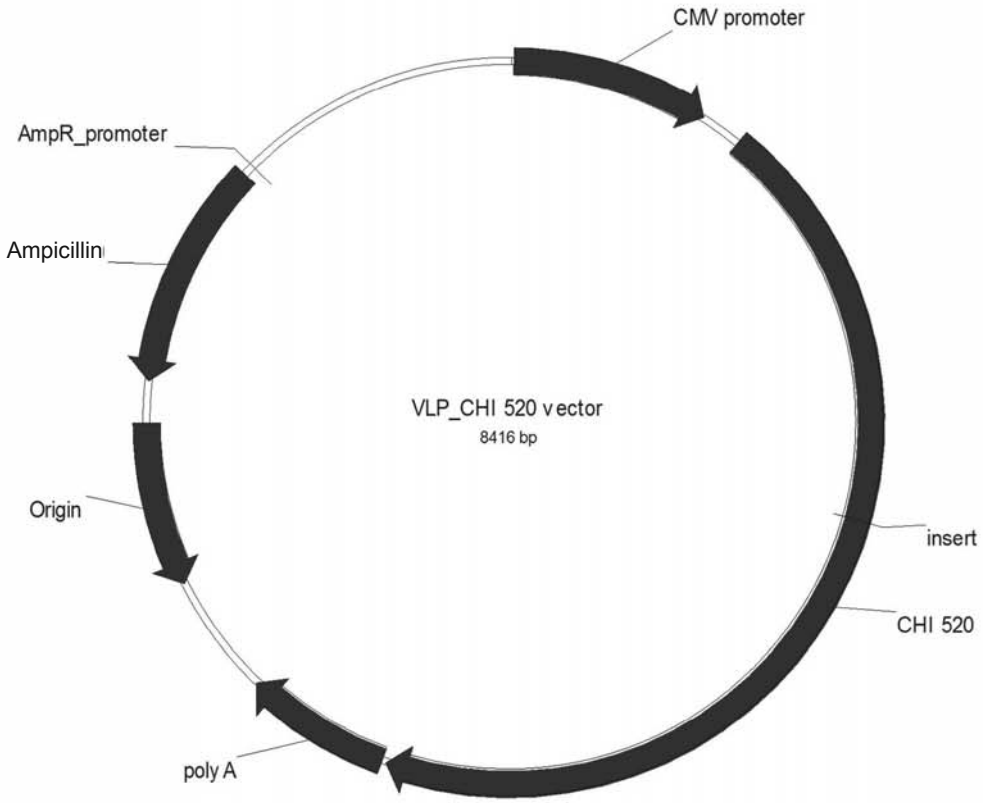

CMV promoter
AmpR_promoter
Ampicillin
VLP_CHI 520 vector
8416 bp
Origin
insert
CHI 520
poly A

Fig. 6

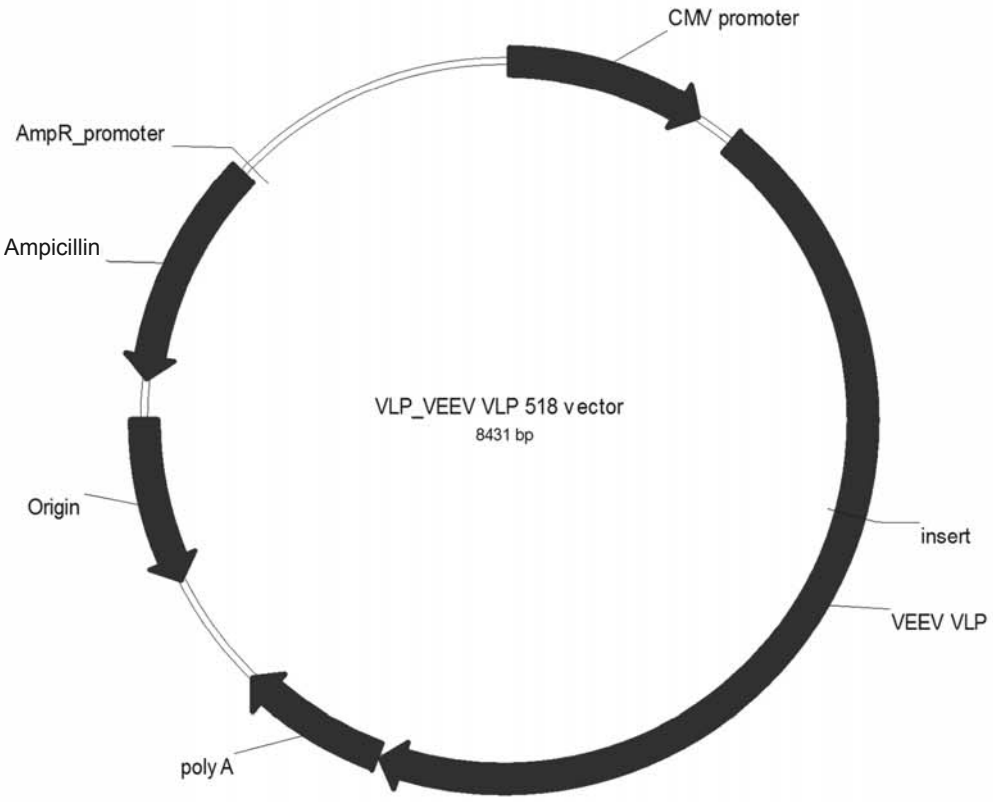

CMV promoter
AmpR_promoter
Ampicillin
VLP_VEEV VLP 518 vector
8431 bp
Origin
insert
VEEV VLP
poly A

Fig.7

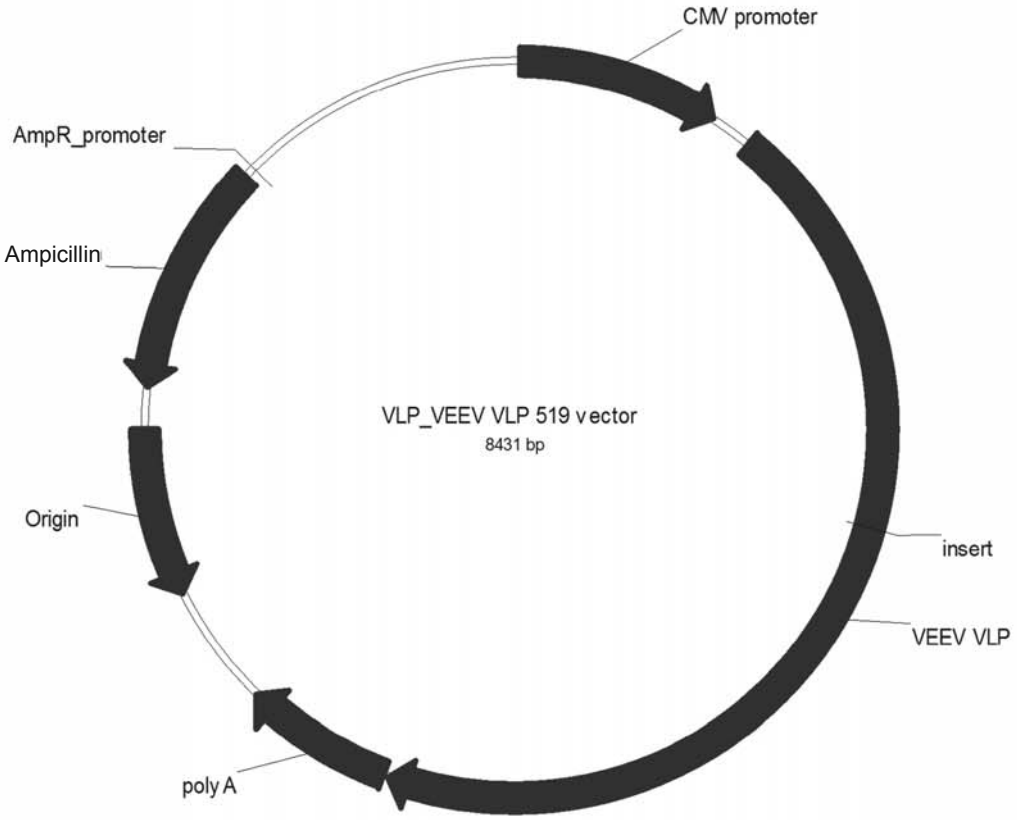
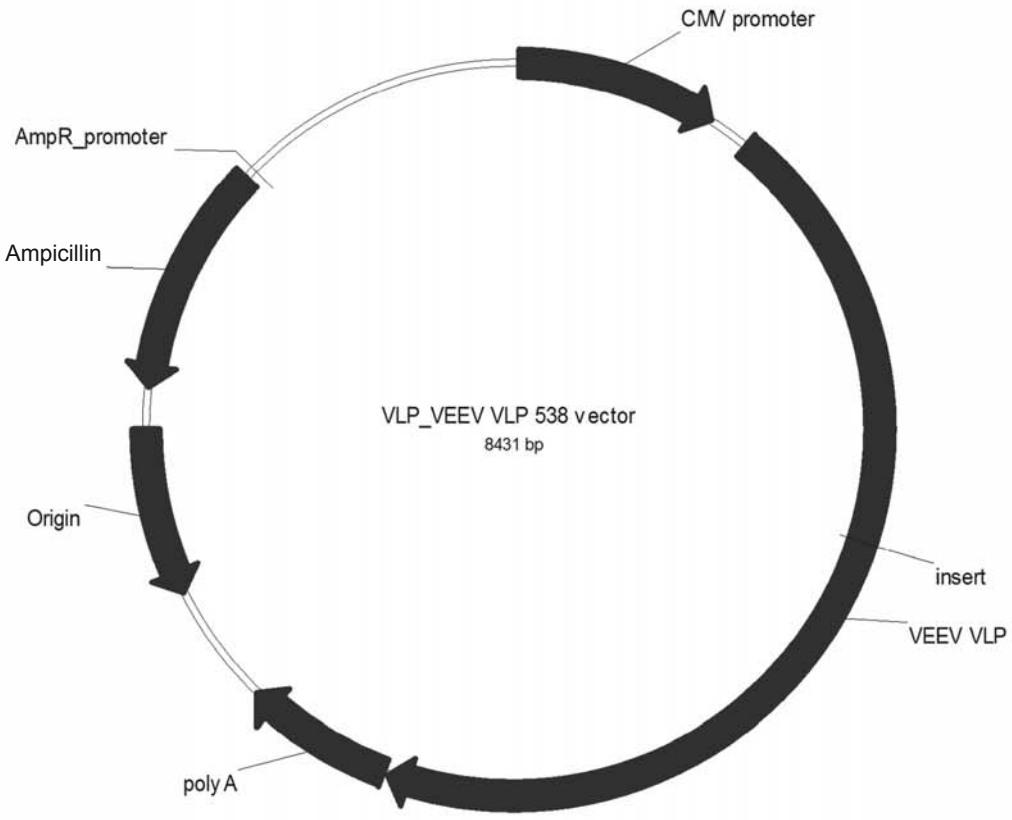

CMV promoter
AmpR_promoter
Ampicillin
VLP_VEEV VLP 519 vector
8431 bp
Origin
insert
VEEV VLP
poly A

Fig.8


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