Fig. 1 : MULTIPLE ALIGNMENT OF ENVELOPE GLYCOPROTEIN SEQUENCE OF JAPANESE ENCEPHALITIS VIRUS BANKURA STRAIN WITH FLAVIVIRUSES

JE_NAKAYAMA	JEV STRAIN NAKAYAMA	JE_BANKURA	JEV STRAIN BANKURA
WEN:	HNV	DEN2PRO:	DENV-2
YEF:	YFV	TBEPRO:	TBEV

SAME AMINO ACID IS MENTIONED BY '.' WHILE THE MUTATED AMINO ACID IS MENTIONED AS THE AMINO ACID CODE. DELETIONS ARE DENOTED BY '–'
THE EPITOPIC REGION IS SHOWN IN GREY BACKGROUND

```
JE_NAKAYAMA  --FNCLGMGNRDFIEGASGATWVDLVLEGDSCLTIMANDKPTLDVRMINIEAVQLAEVRS
JE_BANKURA   ..............................................................
WEN          ..............................................S...............
DEN2PRO      --MR.I.IS...V..V..GS...I..HG..V.T..KN.....FEL.KT..K.P.TL.K
YEF          --AH.I.ITD....VH.G..SAT..Q.K.V.V..P...S..ISLETVAIDRP....K
TBEPRO       YASR.THLE....VT.TQ.T.R.T....LGG-V..T.EG..SM..WLDS.YQENP.KT.E

JE_NAKAYAMA  YCYHASVTDISTVARCPTTGEAHNEKRADSSYVCKQGETDRGNGNGGGLFGKGRTDTCAK
JE_BANKURA   ..............................................................
WEN          ...L...S...R.A...M.........PAF....YV.........................
DEN2PRO      ..ME.KL.NTT.ES....Q..PSLNEEQ.KRF...HSMV.....F...G.V...M
YEF          V..N.VL.HVKINDK..S....LAERNEGDNA..RTYS.....................VA..K
TBEPRO       ..L...KLS.TKVA....M.P.TLAERHQ.GT...RDQS.....H.............V..V

JE_NAKAYAMA  FSCT--SKAIGRTIQPENIKYEVGIFVHGT---TTSENHGNYSAQVGASQAAKFIVTPNA
JE_BANKURA   ..........------------------------------------------------
WEN          .A...-T..T.WI..K.....A....P----.V.S.----KI..T..GR.SI..S.
DEN2PRO      .T.K--KNME.KIV....LE.TIVVTP.S------G.E.AVG--NDTGKHGKEIK...QS
YEF          .T.A--KSMSLFEVDQTKIQ.VIRAQL.VG---AKQ..WN-----TDIKTLKEDALS---
TBEPRO       A..EAKK.AT.HVYDAN..V.T.KVEP.TGDYVAAN.T.S-----GRKTASFTVSSE---

JE_NAKAYAMA  PSITLKLGDYGEVTLDCEPRSGLNTEAFYVMTVGSK------SFLVHREWFHDLALPWTP
JE_BANKURA   ..........------------------------------------------------
WEN          .Y....E....V.....ID.S.Y..S.E----------------M..N...SS
DEN2PRO      SIAEAE.TG..T..ME.S..T..DFNEMVLLQMEN------AW...Q..L..P...L.
YEF          G.QEVEFIG..KA..E.QVQTAVDFGNS.IAEMETF------WI.D.Q.AQ..T...QS
TBEPRO       -RTI.TM....D.S.L.RVA..VDLAQTVILELDKTSEHLPTAWQ...D...N.....KH

JE_NAKAYAMA  PSST---AWRNRELLMEFEEAHATKQSVVALGSQEGGLHQALAGAIVVEYSS----SVKL
JE_BANKURA   ..........------------------------------------------------
WEN          AG....-T.....T.....P.....................A.....P..F..N---T...
DEN2PRO      GAD.QGSN.IQK...VT.KNP..K..D..V.....AM.T..T..TEIQM.----GNL.
YEF          ..GG---V..EMHH.V...PP..ATTR.L...N...S.KT..T.MR.TKDTNDNNLY..
TBEPRO       EGAQ---N.N.A.R.V..GAP..V.MD.YN..D.T.V.LKS...VP.AHIDG---TKVH.

JE_NAKAYAMA  TSGHLKCRLKMDKLALKGTTYGMCTE-KFSFAKNPADTGHGTVVIELSYSGSDGPCKIPI
JE_BANKURA   ..........------------------------------------------------
WEN          .......V..E..Q.....V.SK-A.K..RT.....L..Q.T.T.....V..
DEN2PRO      FT.....LR...Q..MS.S...G...KVV.EI.E.Q...I..RV..E.DGS.....-
YEF          HG..VS..V.LSA.T..MS.KI..D..MF.V...T.....MQ.KV.-KGA..R..V
TBEPRO       KS..VT.EVGLE..KM..LS.T..DKT..TWKRI.T.S..D...M..AF.-GTK..R..V

JE_NAKAYAMA  VSVASLNDMTPVGRLVTVNPFVATSSANSKVLVEMEPPFGDSYIVVGRGDKQINQISNHHKA
JE_BANKURA   ..........------------------------------------------H.......
WEN          S.....L.............SVAT.....I.L.................EQ...H....S
DEN2PRO      FEIMD.EKRHVL...I....I.TEK--D.P.NI.A.........II.VEPG.LKLN.F.K
YEF          IVAD..TAAINK.I.....IAS.N--DDE..I.VN.........I.....SRLTYQ.H.E
TBEPRO       RA..HGSPDVN.AM.M.P..TIENM---GGGFI..QL.P..NI.Y.----ELSHQ..QK

JE_NAKAYAMA  GSTLGKAFSTTLKGAQRLAALGDTAWDFGSIGGVFNSIGKAVHQVFGGAFRTLFGGMSWI
JE_BANKURA   ..........------------------------------------------------
WEN          ..SI...T...R.....................V...T.V...I.....S.....
DEN2PRO      ..SI.QM.E..MR..K.M.I.............L....T.I...L....AIYGAA.S.V..
YEF          ..SI...L.TQ.M..VE...VM.....S.A..F.T.V..GI.T...S..QG..G.LN.
TBEPRO       ...SI.RV.QK.R...IE..TVI.EH....T..FLT.V...L.T.L....ND....VGFL

JE_NAKAYAMA  TQGLMGALLLWMGVNARDRSIALAFLATGGVLVFLATNVHA
JE_BANKURA   ..........------------------------------
WEN          ....L.....I.....MT...V...L..SV.....
DEN2PRO      MKI.I.VIIT.I.M.S.ST.LSVPLVLV.I.TLY.GVM.Q.
YEF          ..VIM..VLI.V.I.T.NMTMSMSMI.V.VIMM..SLG.G.
TBEPRO       P.I.V-VVLA.LLI.M.NPTMSMS...A..LVLAMTLG.G.
```

Fig. 2 : MULTIPLE ALIGNMENT OF ENVELOPE GLYCOPROTEIN SEQUENCE OF JAPANESE ENCEPHALITIS VIRUS BANKURA STRAIN WITH OTHER JEV STRAINS

JE_NAKAYAMA	JEV NAKAYAMA STRAIN	JE BANKURA	JEV BANKURA STRAIN (733913)
JE_JAO	JEV JAOAR5892 STRAIN	SLKJEV	JEV SRILANKAN ISOLATE(691004)
SA14A	JEV VACCINE STRAIN	JEVPRT	JEV

IDENTICAL AMINOACIDs ARE REPRESENTED BY '.' WHILE CHANGES ARE DENOTED BY THE MUTATED AMINO ACID

```
                                                                                                60
JE_NAKAYAMA     FNCLGMGNRDFIEGASGATWVDLVLEGDSCLTIMANDKPTLDVRMINIEAVQLAEVRSYC
JE_BANKURA      ................................................................
JE_JAO          ...............................................................S
SLKJEV          ...............................................................S
SA14A           .....T..........................................................T.....
JEVPRT          .....T..........................................................S.....

                                                                                               120
JE_NAKAYAMA     YHASVTDISTVARCPTTGEAHNEKRADSSYVCKQGFTDRGWGNGGGLFGKGSIDTCAKFS
JE_BANKURA      ................................................................
JE_JAO          ................................................................
SLKJEV          ..............K.................................................
SA14A           ................................................F...............
JEVPRT          ................................................................

                                                                                               180
JE_NAKAYAMA     CTSKAIGRTIQPENIKYEVGIFVHGTTTSENHGNYSAQVGASQAAKFIVTPNAPSITLKL
JE_BANKURA      ................................................................
JE_JAO          ...............................................TI...............
SLKJEV          ................................................I...............
SA14A           ..........W.....................................V...............
JEVPRT          ....K...........................................VP..............

                                                                                               240
JE_NAKAYAMA     GDYGEVTLDCEPRSGLNTEAFYVMTVGSKSFLVHREWFHDLALPWTPPSSTAWRNRELLM
JE_BANKURA      ................................................................
JE_JAO          ...............................................S................
SLKJEV          ...............................................S................
SA14A           ..........R.....L...............................................
JEVPRT          ...............................................S................

                                                                                               300
JE_NAKAYAMA     EFEEAHATKQSVVALGSQEGGLHQALAGAIVVEYSSSVKLTSGHLKCRLKMDKLALKGTT
JE_BANKURA      ................................................................
JE_JAO          ................................................................
SLKJEV          ................................................................
SA14A           .G..............H.....M.........................................Q...
JEVPRT          ................................................................

                                                                                               360
JE NAKAYAMA     YGMCTEKFSFAKNPADTGHGTVVIELSYSGSDGPCKIPIVSVASLNDMTPVGRLVTVNPF
JE BANKURA      ................................................................
JE JAO          ................................................................
SLKJEV          ................................................................
SA14A           ..........V.....................................................
JEVPRT          ................................................................

                                                                                               420
JE NAKAYAMA     VATSSANSKVLVEMEPPFGDSYIVVGRGDKQINQHWHKAGSTLGKAFSTTLKGAQRLAAL
JE BANKURA      ..........................H.....................................
JE JAO          ..........................H.....................................
SLKJEV          ..........................H.....................................
SA14A           ..........................H.....................................
JEVPRT          ..........................H.....................................

                                                                                               480
JE_NAKAYAMA     GDTAWDFGSIGGVFNSIGKAVHQVFGGAFRTLFGGMSWITQGLMGALLLWMGVNARDRSI
JE_BANKURA      ................................................................
JE_JAO          ................................................................
SLKJEV          ..............................L.................................
SA14A           ..............R.................................................
JEVPRT          ................................................................

JE_NAKAYAMA     ALAFLATGGVLVFLATNVHA
JE_BANKURA      --------------------
JE_JAO          --------------------
SLKJEV          --------------------
SA14A           --------------------
JEVPRT          --------------------
```

Fig. 3

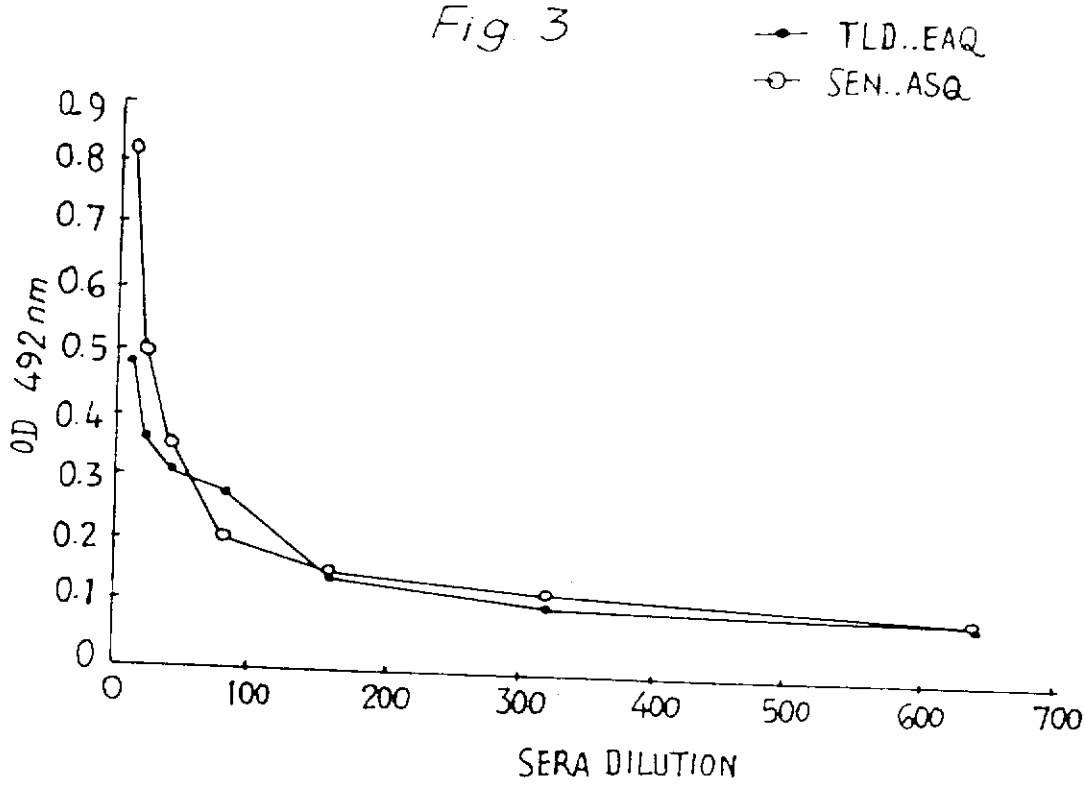
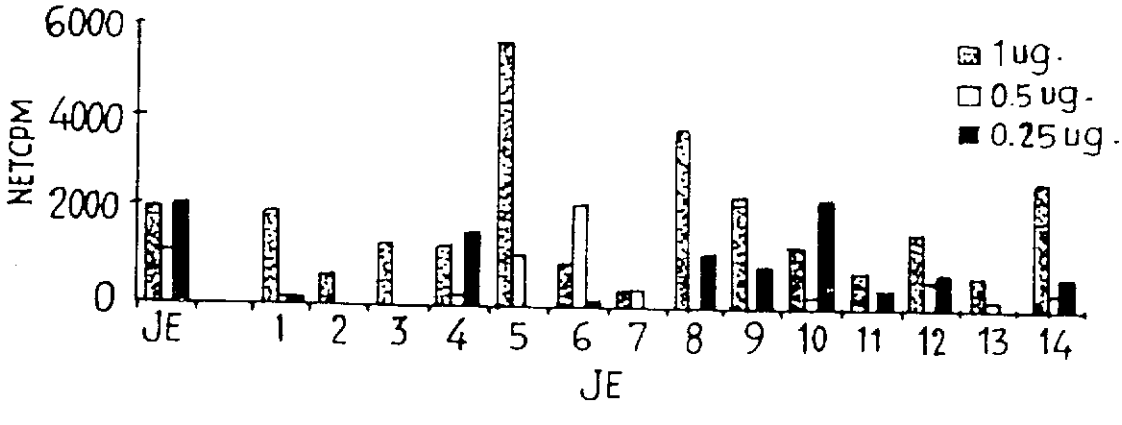

TLD..EAQ
SEN..ASQ
OD 492nm
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
100
200
300
400
500
600
700
SERA DILUTION

Fig. 4


NETCPM
6000
4000
2000
0
1ug.
0.5ug.
0.25ug.
JE
1
2
3
4
5
6
7
8
9
10
11
12
13
14
JE

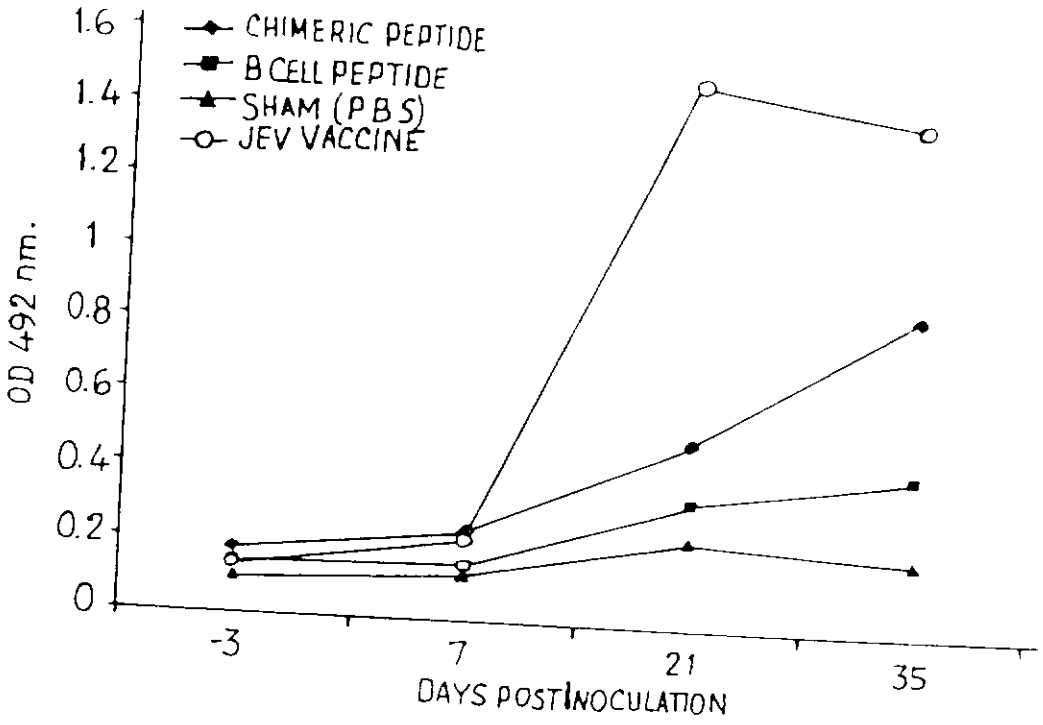

CHIMERIC PEPTIDE
B CELL PEPTIDE
SHAM (PBS)
JEV VACCINE
OD 492 nm.
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-3
7
21
35
DAYS POST INOCULATION

Fig. 5a

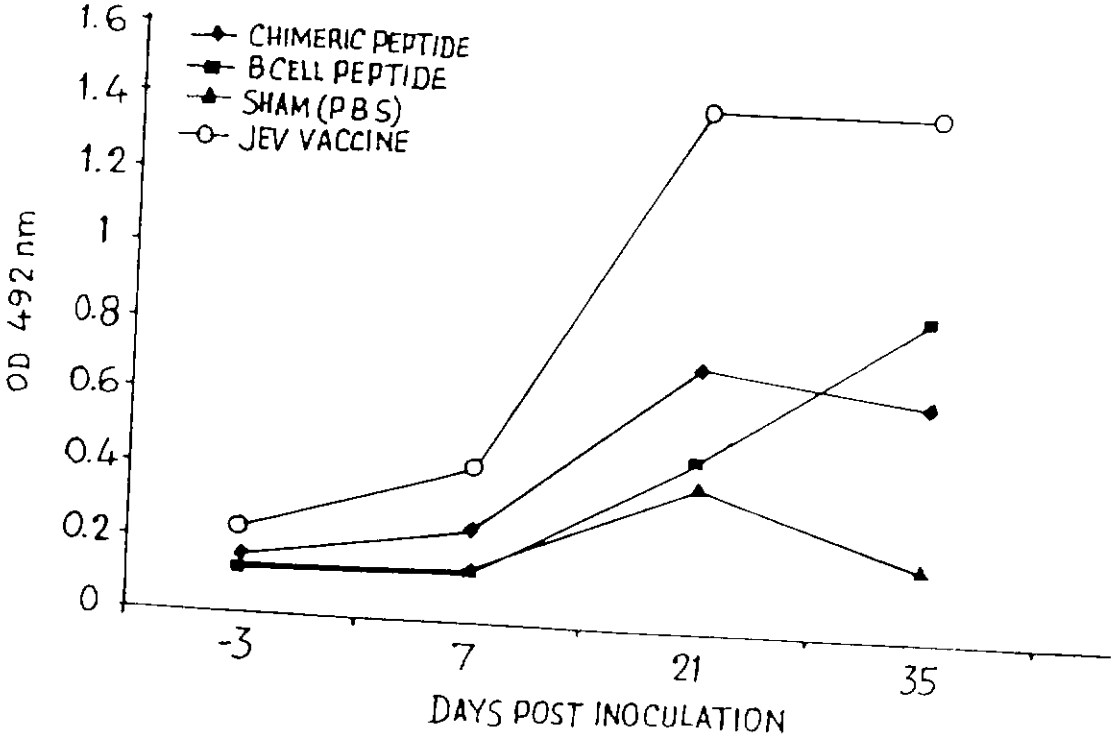

CHIMERIC PEPTIDE
B CELL PEPTIDE
SHAM (PBS)
JEV VACCINE
OD 492 nm
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-3
7
21
35
DAYS POST INOCULATION

Fig. 5b

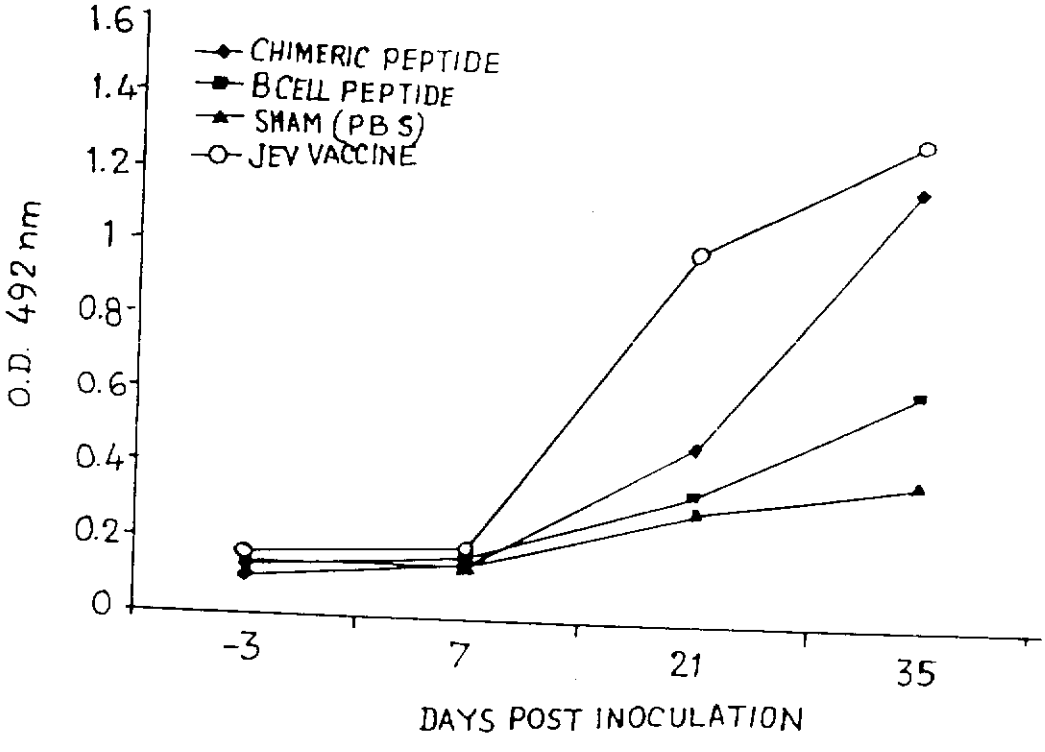

1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
O.D. 492 nm
CHIMERIC PEPTIDE
BCELL PEPTIDE
SHAM (PBS)
JEV VACCINE
-3
7
21
35
DAYS POST INOCULATION

Fig. 5c

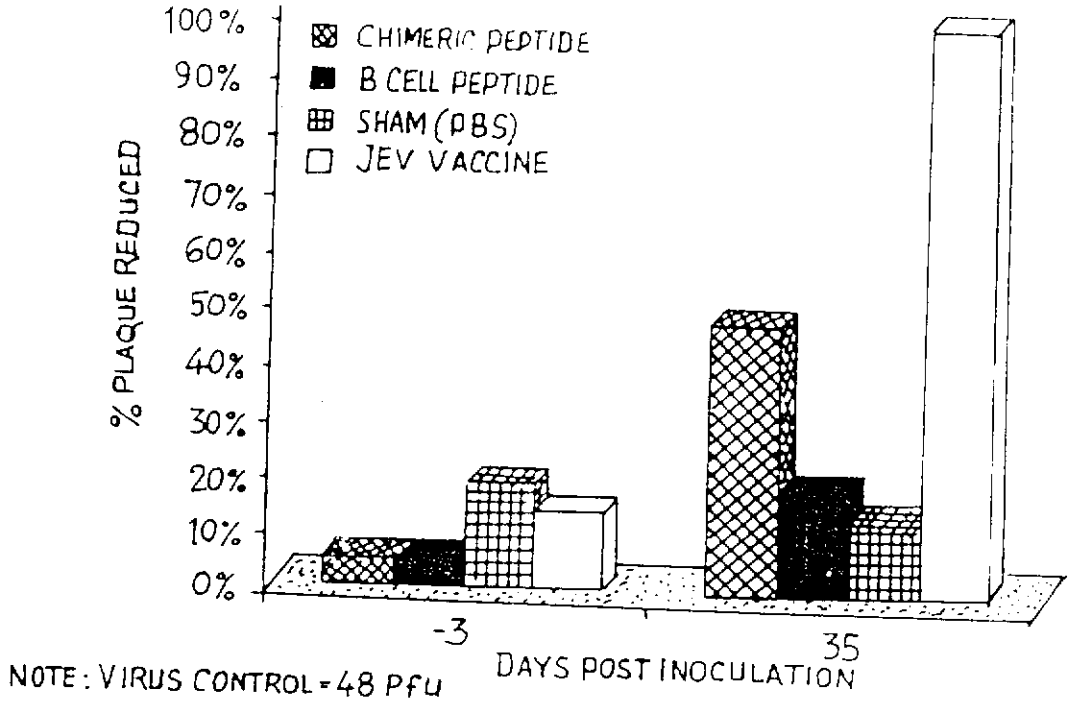

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% PLAQUE REDUCED
CHIMERIC PEPTIDE
B CELL PEPTIDE
SHAM (PBS)
JEV VACCINE
-3
35
DAYS POST INOCULATION
NOTE: VIRUS CONTROL = 48 Pfu

Fig. 6

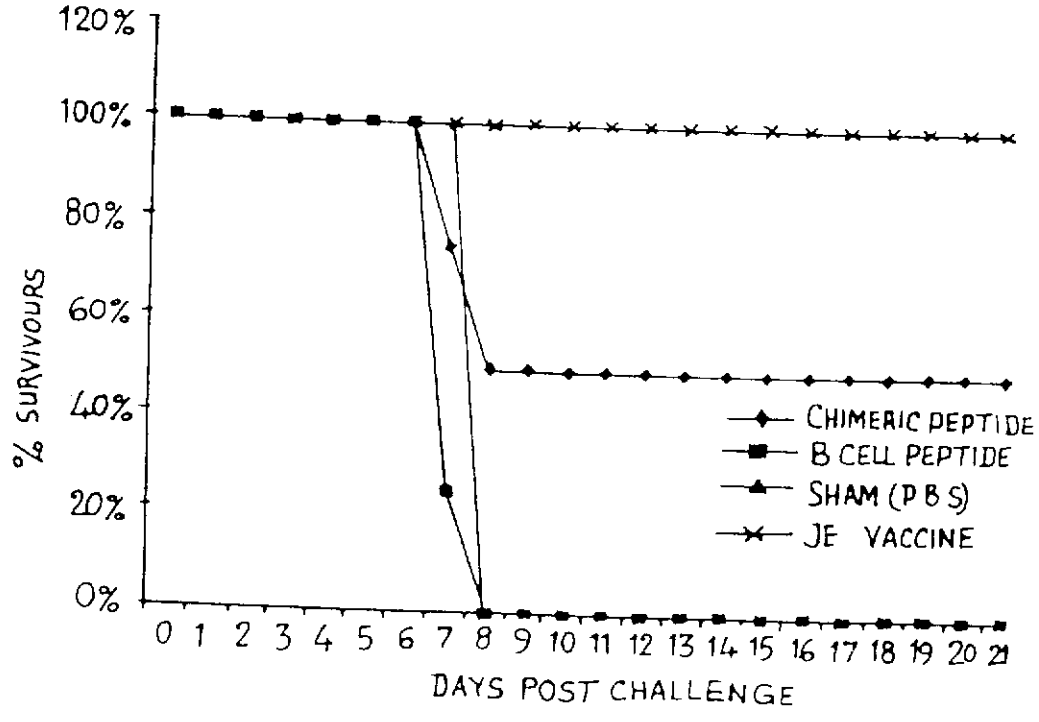

120%
100%
80%
60%
40%
20%
0%
% SURVIVOURS
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
DAYS POST CHALLENGE
CHIMERIC PEPTIDE
B CELL PEPTIDE
SHAM (PBS)
JE VACCINE

Fig. 7