Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Informations 1

Reaching beyond HIV/HCV: Nelfinavir as a potential starting point for broad-spectrum protease inhibitors against dengue and chikungunya virus

Soumendranath Bhakat[a*], Leen Delang[c], Suzanne Kaptein[c], Johan Neyts[c*], Pieter Leyssen[c], Venkatesan Jayaprakash[b*]

a Division of Biophysical Chemistry, Lund University, P.O. Box 124, SE-22100 Lund, Sweden

b Department of Pharmaceutical Sciences, Birla Institute of Technology, Mesra-835215, India

c KU Leuven - University of Leuven, Rega Institute for Medical Research, B-3000 Leuven, Belgium

*Corresponding authors

Soumendranath Bhakat; email: soumendranath.bhakat@bpc.lu.se

Venkatesan Jayaprakash; email: venkatesanj@bitmesra.ac.in

Johan Neyts; email: johan.neyts@rega.kuleuven.be

Active site identification of CHIKV NSP2 (PDB: 3TRK)

Output from SiteHound Web (http://scbx.mssm.edu/sitehound/sitehound-web/Input.html)

CYS 1013 A
TRP 1014 A
LYS 1045 A
ALA 1046 A
TYR 1047 A
SER 1048 A
VAL 1051 A
TYR 1079 A
ASN 1082 A
TRP 1084 A
LEU 1203 A
GLU 1204 A
LEU 1205 A
GLY 1206 A
ALA 1237 A
LYS 1239 A
GLN 1241 A
LEU 1243 A
ASP 1246 A

Output from MetaPocket (http://projects.biotec.tu-dresden.de/metapocket/)

```
RESI      ALA_A^1010^   ASN_A^1011^   CYS_A^1013^   ASN_A^1082^
HIS_A^1083^
RESI      TYR_A^1079^   TRP_A^1084^   VAL_A^1012^   TRP_A^1014^
ASP_A^1081^
RESI      LEU_A^1205^   TYR_A^1047^   ALA_A^1046^   SER_A^1048^
PRO_A^1049^
```

```
RESI      GLU_A^1204^   ASN_A^1202^   ASP_A^1044^   LYS_A^1045^
GLY_A^1206^
RESI      ASP_A^1246^   LEU_A^1207^   GLN_A^1241^   LEU_A^1203^
VAL_A^1051^
RESI      GLY_A^1245^   LEU_A^1243^   LEU_A^1192^   PRO_A^1191^
ALA_A^1040^
RESI      LYS_A^1239^   THR_A^1268^   ALA_A^1237^   GLY_A^1244^
GLU_A^1055^
RESI      ILE_A^1038^   GLN_A^1039^   ASP_A^1235^   LEU_A^1240^
GLU_A^1043^
RESI      ILE_A^1037^   VAL_A^1234^   HIS_A^1236^   GLN_A^1231^
ILE_A^1221^
RESI      ARG_A^1226^   THR_A^1223^   PRO_A^1224^   HIS_A^1222^
PHE_A^1225^
RESI      VAL_A^1272^   ASP_A^1266^   SER_A^1269^   CYS_A^1233^
GLY_A^1176^
RESI      ASN_A^1220^   TYR_A^1177^   GLU_A^1050^   LYS_A^1091^
ARG_A^1271^
RESI      ARG_A^1267^
```

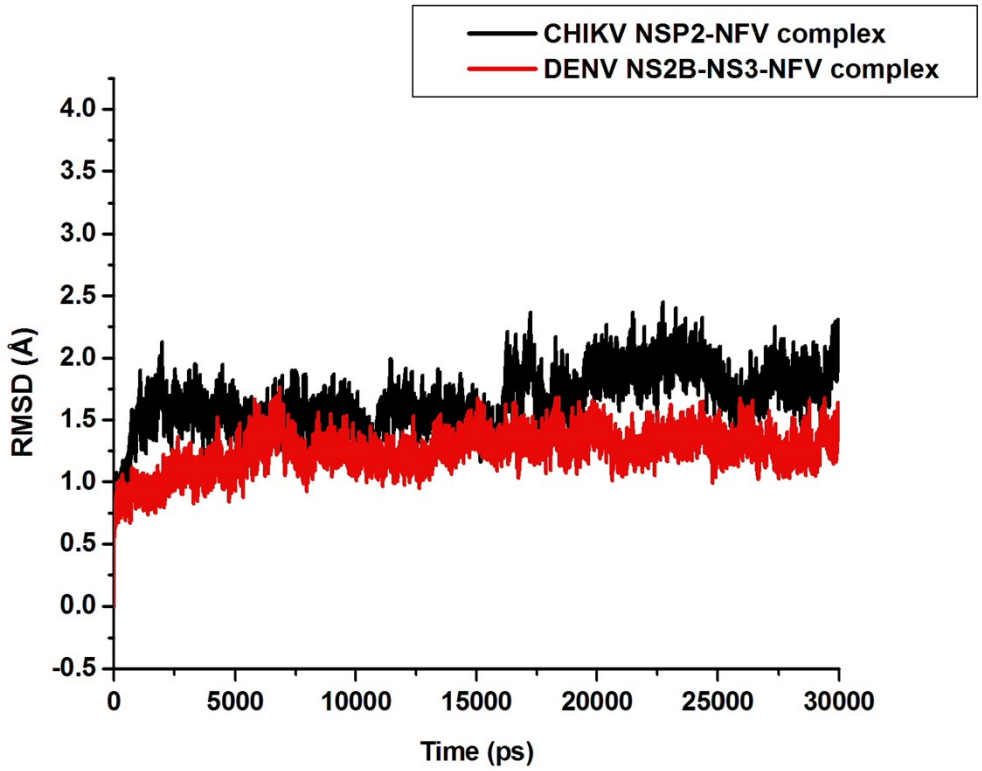

Figure S1. C-α RMSD fluctuation of CHIKV NSP2 and DENV NS2B-NS3 complexed with NFV during simulation time.

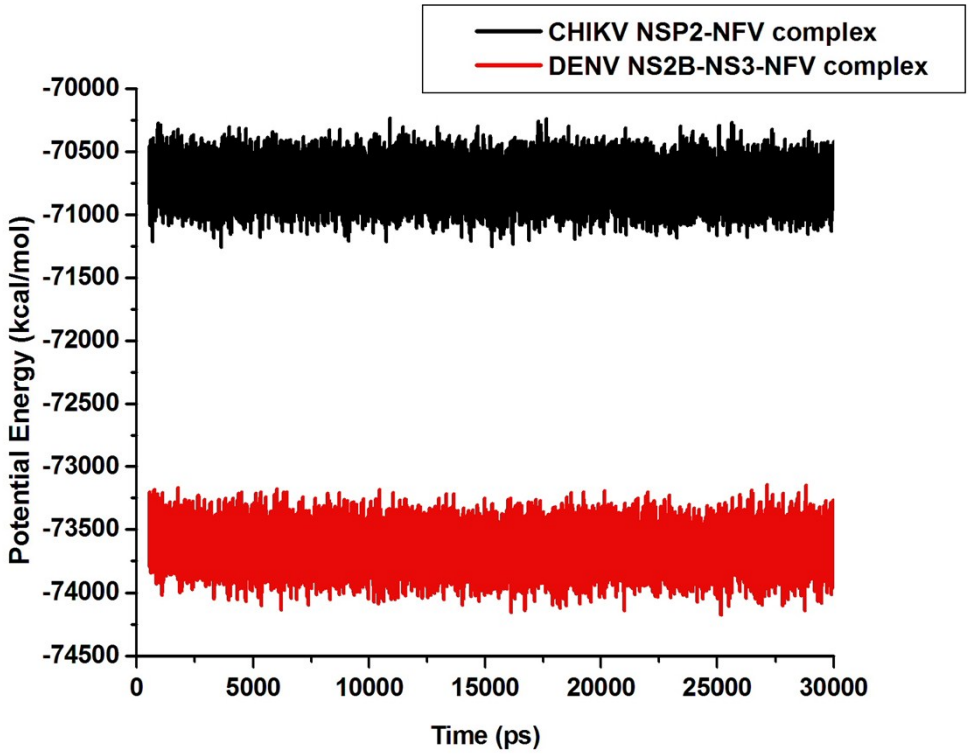

Figure S2. Potential energy fluctuation of CHIKV NSP2 and DENV NS2B-NS3 complexed with NFV during simulation time.

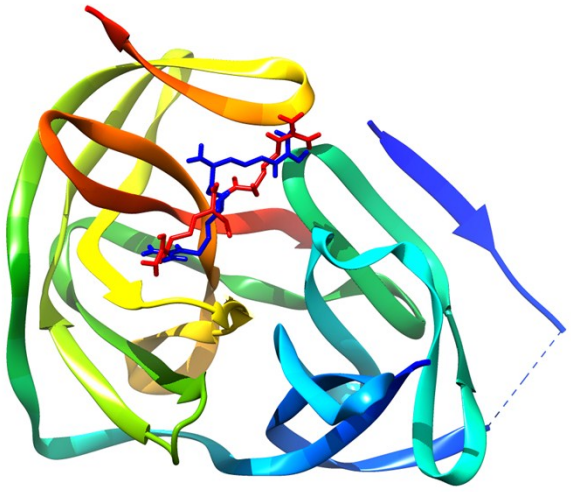

Figure S3. Redocking of the peptide inhibitor in the active site of DENV NS2B-NS3 protease. The co-crystal and docked ligand is highlighted in red and blue respectively. Due to its linear shape and peptide nature it is hard to derive a similar binding pose using molecular docking but its binding in almost similar cavity in proximity with the co-crystal ligand gives solid credibility to the preciseness of the docking.