Table S1. Antibody reagents used in immunoassays.

| Construct     | ELISA capture antibody | ELISA detection antibody | IFA detector antibody     |
|---------------|------------------------|--------------------------|---------------------------|
| DENV1 WT-VLP  | DENV1 RIS (1:500)      | DENV1 MHIAF (1:2000)     | DENV1 mouse MAb (1:200)   |
| DENV1 CRR-VLP | DENV1 RIS (1:500)      | DENV1 MHIAF (1:2000)     | DENV1 mouse MAb (1:200)   |
| DENV1 NS1     | DENV1 MHIAF (1:2000)   | FLAVIVIRUS NS1 MAb (1:400)|                          |
| DENV2 WT-VLP  | DENV2 RIS (1:2000)     | DENV2 MHIAF (1:2000)     | DENV2 Mouse MAb (1:200)   |
| DENV2 CRR-VLP | DENV2 RIS (1:2000)     | DENV2 MHIAF (1:2000)     | DENV2 Mouse MAb (1:200)   |
| DENV2 NS1     | DENV2 MHIAF (1:2000)   | FLAVIVIRUS NS1 MAb (1:400)|                          |
| DENV3 WT-VLP  | DENV3 RIS (1:1500)     | DENV3 MHIAF (1:2000)     | DENV3 MAb (1:200)         |
| DENV3 CRR-VLP | DENV3 RIS (1:1500)     | DENV3 MHIAF (1:2000)     | DENV3 MAb (1:200)         |
| DENV3 NS1     | DENV3 MHIAF (1:2000)   | FLAVIVIRUS NS1 MAb (1:400)|                          |
| DENV4 WT-VLP  | DENV4 RIS (1:1500)     | DENV4 MHIAF (1:2000)     | DENV4 Mouse MAb (1:200)   |
| DENV4 CRR-VLP | DENV4 RIS (1:1500)     | DENV4 MHIAF (1:2000)     | DENV4 Mouse MAb (1:200)   |
| DENV4 NS1     | DENV4 MHIAF (1:2000)   | FLAVIVIRUS NS1 MAb (1:400)|                          |
| JEV WT-VLP    | JEV RIS (1:800)        | JEV MHIAF (1:8000)       | JEV MAb (1:200)           |
| JEV CRR-VLP   | JEV RIS (1:800)        | JEV MHIAF (1:8000)       | JEV MAb (1:200)           |
| JEV NS1       | JEV MHIAF (1:8000)     | JEV MAb (1:200)          |                           |
| WNV WT-VLP    | WNV RIS (1:1500)       | WNV MHIAF KW14/157 (1:1000)| WNV MAb (1:200)           |
| WNV CRR-VLP   | WNV RIS (1:1500)       | WNV MHIAF KW14/157 (1:1000)| WNV MAb (1:200)           |
| WNV NS1       | WNV MHIAF (1:1000)     | WNV MAb (1:200)          |                           |
| YFV 17D WT-VLP| YFV HORSE IS (1:2000)  | YFV 1362/77 MAb (1:800)  | YFV 17D MAb (1:200)       |
| YFV 17D CRR-VLP| YFV HORSE IS (1:2000)  | YFV 1362/77 MAb (1:800)  | YFV 17D MAb (1:200)       |
| YFV 17D NS1   | YFV 1362/77 MAb (1:800)| YFV 1362/77 MAb (1:800)  | YFV 1362/77 MAb (1:200)   |
| USUV WT-VLP   | USUV RIS (1:1000)      | USUV MHIAF (1:1000)      | USUV MAb (1:200)          |
| USUV CRR-VLP  | USUV RIS (1:1000)      | USUV MHIAF (1:1000)      | USUV MAb (1:200)          |
| USUV NS1      | USUV MHIAF (1:1000)    | USUV MAb (1:200)         |                           |
| SLEV WT-VLP   | SLEV RIS (1:500)       | SLEV MAb (1:1000)        | SLEV Mouse MAb (1:200)    |
| SLEV CRR-VLP  | SLEV RIS (1:500)       | SLEV MAb (1:1000)        | SLEV Mouse MAb (1:200)    |
| SLE NS1       | SLEV MHIAF (1:1000)    | SLEV MAb (1:200)         |                           |
| POWV WT-VLP   | POWV RIS (1:500)       | POWV MAb (1:1000)        | POWV MAb (1:200)          |
| POWV NS1      | POWV MHIAF (1:1000)    | POWV MAb (1:200)         |                           |
| ZIKV WT-VLP   | ZIKV RIS (1:2000)      | ZIKV MAb (1:1000)        | ZIKV MAb (1:200)          |
| ZIKV CRR-VLP  | ZIKV RIS (1:2000)      | ZIKV MAb (1:1000)        | ZIKV MAb (1:200)          |
| ZIKV NS1      | ZIKV MAb (1:2000)      | ZIKV MAb (1:200)         | ZIKV MAb (1:200)          |
| ROCV WT-VLP   | ROCV RIS (1:500)       | ROCV MAb (1:1000)        | ROCV MAb (1:200)          |
| ROCV NS1      | ROCV MHIAF (1:1000)    | ROCV MAb (1:200)         |                           |
| ILHV WT-VLP   | ILHV RIS (1:500)       | ILHV MAb (1:1000)        | ILHV MAb (1:200)          |
| ILHV CRR-VLP  | ILHV RIS (1:500)       | ILHV MAb (1:1000)        | ILHV MAb (1:200)          |
| ILHV NS1      | ILHV MHIAF (1:1000)    | ILHV MAb (1:200)         |                           |

\(^a\)RIS = rabbit immune sera  
\(^b\)MHIAF= mouse hyper-immune ascitic fluid  
\(^*\)MAb= monoclonal antibody