

## Supplementary Materials: Epitope Sequences in Dengue Virus NS1 Protein Identified by Monoclonal Antibodies

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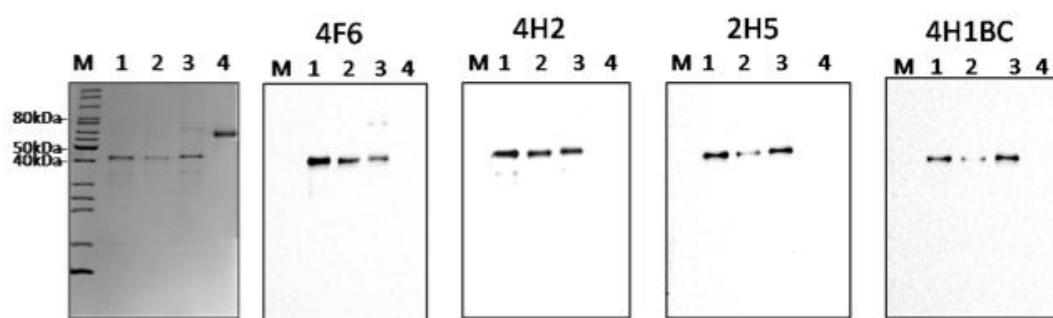


Figure S1. Characterization of NS1-specific mAbs reactivity by immunoblotting.

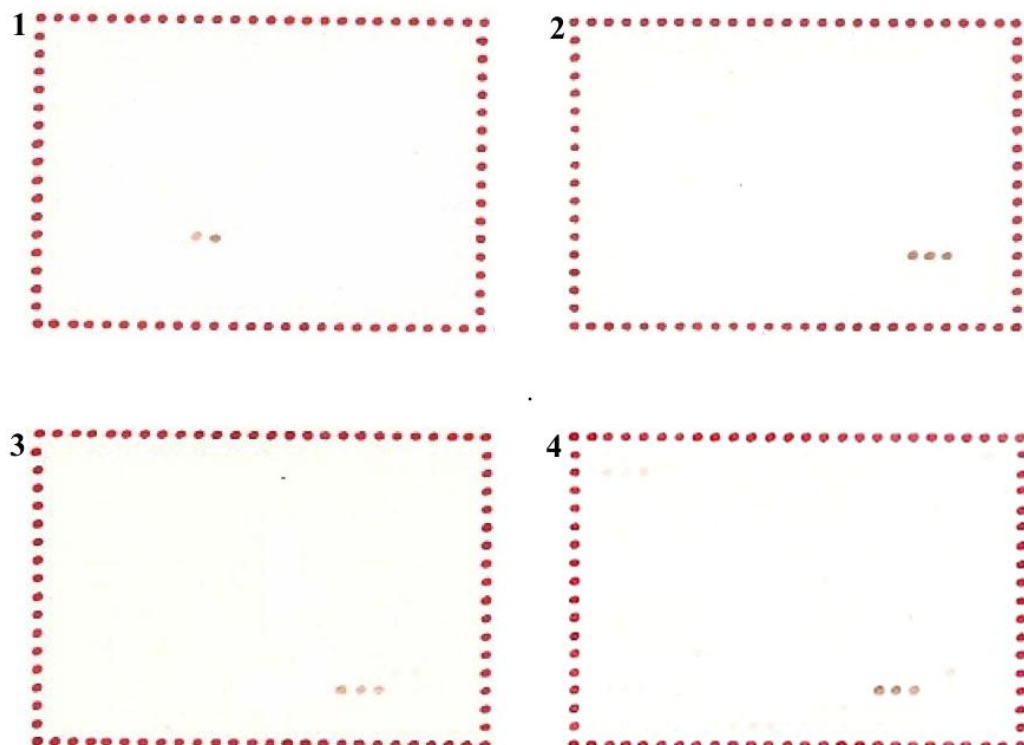


Figure S2. Epitope mapping with NS1-derived synthetic peptides.

**Table S1.** Epitope analysis of conservancy in different strains of DENV serotypes and Zika strains.

| Protein Name                     | Positions          | Protein Sub-Sequence(s)                 | Identity |
|----------------------------------|--------------------|---|----------|
| <b>4F6 mAb</b>                   |                    |   |          |
| DENV1ns1_AAN06982USA             | 25–38              | VHTWTEQYKFQADS                          | 85.71%   |
| DENV1ns1_ABK27927China           | 25–38              | VHTWTEQYKFQADS                          | 85.71%   |
| DENV2_JHA1                       | 25–38              | VHTWTEQYKFPES                           | 100.00%  |
| DENV2_NGC                        | 25–38              | VHTWTEQYKFPES                           | 100.00%  |
| DENV2_DENV2_FJ687441_Thailand    | 25–38              | VHTWTEQYKFPES                           | 100.00%  |
| DENV3ns1_AAS49486                | 23–36<br>401–414   | VHTWTEQYKFQADS<br>VHTWTEQYKFQADS        | 85.71%   |
| DENV3ns1_AAX19004Indonésia       | 25–38              | VHTWTEQYKFQADS                          | 85.71%   |
| DENV4ns1_AAK01233USA             | 25–38              | VHTWTEQYKFPES                           | 100.00%  |
| DENV4ns1_Q5UCB8                  | 24–37              | VHTWTEQYKFPES                           | 100.00%  |
| DENV4_GQ868585_Colombia          | 25–38              | VHTWTEQYKFPES                           | 100.00%  |
| AMR39836_Zika_virus              | 23–36              | VEAWRDYKYHPDS                           | 42.86%   |
| AMD61710_Zika_virus              | 23–36              | VEAWRDYKYHPDS                           | 42.86%   |
| ASK51714_Zika_virus              | 25–38              | VEAWRDYKYHPDS                           | 42.86%   |
| ARB07967_Zika_virus              | 25–38              | VEAWRDYKYHPDS                           | 42.86%   |
| AMD16557_Zika_virus              | 23–36              | VEAWRDYKYHPDS                           | 42.86%   |
| <b>4H2 mAb</b>                   |                    |   |          |
| DENV2_JHA1                       | 127–143            | ELHNQTFLIDGPETAEC                       | 100.00%  |
| DENV2_NGC                        | 127–143            | ELHNQTFLIDGPETAEC                       | 100.00%  |
| DENV2_DENV2_FJ687441_Thailand    | 127–143            | ESHNQTFLIDGPETAEC                       | 94.12%   |
| DENV4ns1_AAK01233USA             | 127–143            | EARNSTFLIDGPDPTSEC                      | 70.59%   |
| DENV4ns1_Q5UCB8                  | 126–142            | EARNSTFLIDGPDPTSEC                      | 70.59%   |
| DENV4_GQ868585_Colombia          | 127–143            | EARNSTFLIDGPDPTSEC                      | 70.59%   |
| AMR39836_Zika_virus              | 125–141            | AKTNNSFVVDGDTLKEC                       | 35.29%   |
| AMD61710_Zika_virus              | 125–141            | AKTNNSFVVDGDTLKEC                       | 35.29%   |
| ASK51714_Zika_virus              | 127–143            | AKTNNSFVVDGDTLKEC                       | 35.29%   |
| ARB07967_Zika_virus              | 127–143            | AKTNNSFVVDGDTLKEC                       | 35.29%   |
| AMD16557_Zika_virus              | 125–141            | AKTNNSFVVDGDTLKEC                       | 35.29%   |
| <b>2H5 mAb</b>                   |                    |   |          |
| DENV1_GU131863_SãoPaulo (Brazil) | 193–209            | AVHADMGYWIESEKNET                       | 82.35%   |
| DENV1ns1_AAN06982USA             | 193–209            | AVHADMGYWIESEKNET                       | 82.35%   |
| DENV1ns1_ABK27927China           | 193–209            | AVHADMGYWIESEKNET                       | 82.35%   |
| DENV2_JHA1                       | 193–209            | AVHADMGYWIESALNDT                       | 100.00%  |
| DENV2_NGC                        | 193–209            | AVHADMGYWIESALNDT                       | 100.00%  |
| DENV2_DENV2_FJ687441_Thailand    | 193–209            | AVHADMGYWIESALNDT                       | 100.00%  |
| DENV3ns1_AAS49486                | 191–207<br>569–585 | AVHADMGYWIESQKNGS,<br>AVHADMGYWIESQKNGS | 76.47%   |
| DENV3ns1_AAX19004Indonésia       | 193–209            | AVHADMGYWIESQKNGS                       | 76.47%   |
| DENV4ns1_AAK01233USA             | 193–209            | AVHADMGYWIESSKNQT                       | 82.35%   |
| DENV4ns1_Q5UCB8                  | 192–208            | AVHADMGYWIESSKNQT                       | 82.35%   |

|                                 |                    |                   |         |
|---------------------------------|--------------------|-------------------|---------|
| DENV4_GQ868585_Colombia         | 193–209            | AVHADMGYWIESSKNQT | 82.35%  |
| AMR39836_Zika_virus             | 191–207            | AAHSDLGYWIESEKNDT | 70.59%  |
| AMD61710_Zika_virus             | 191–207            | AVHSDLGYWIESEKNDT | 76.47%  |
| ASK51714_Zika_virus             | 193–209            | AVHSDLGYWIESEKNDT | 76.47%  |
| ARB07967_Zika_virus             | 193–209            | AVHSDLGYWIESEKNDT | 76.47%  |
| AMD16557_Zika_virus             | 191–207            | AVHSDLGYWIESEKNDT | 76.47%  |
| <b>4H1BC mAb</b>                |                    |                   |         |
| DENV1_GU131863_SãoPaulo(Brazil) | 193–209            | AVHADMGYWIESEKNET | 82.35%  |
| DENV1ns1_AAN06982USA            | 193–209            | AVHADMGYWIESEKNET | 82.35%  |
| DENV1ns1_ABK27927China          | 193–209            | AVHADMGYWIESEKNET | 82.35%  |
| DENV2_JHA1                      | 193–209            | AVHADMGYWIESALNDT | 100.00% |
| DENV2_NGC                       | 193–209            | AVHADMGYWIESALNDT | 100.00% |
| DENV2_DENV2_FJ687441_Thailand   | 193–209            | AVHADMGYWIESALNDT | 100.00% |
| DENV3ns1_AAS49486               | 191–207<br>569–585 | AVHADMGYWIESQKNGS | 76.47%  |
| DENV3ns1_AAX19004Indonésia      | 193–209            | AVHADMGYWIESQKNGS | 76.47%  |
| DENV4ns1_AAK01233USA            | 193–209            | AVHADMGYWIESSKNQT | 82.35%  |
| DENV4ns1_Q5UCB8                 | 192–208            | AVHADMGYWIESSKNQT | 82.35%  |
| DENV4_GQ868585_Colombia         | 193–209            | AVHADMGYWIESSKNQT | 82.35%  |
| AMR39836_Zika_virus             | 191–207            | AAHSDLGYWIESEKNDT | 70.59%  |
| AMD61710_Zika_virus             | 191–207            | AVHSDLGYWIESEKNDT | 76.47%  |
| ASK51714_Zika_virus             | 193–209            | AVHSDLGYWIESEKNDT | 76.47%  |
| ARB07967_Zika_virus             | 193–209            | AVHSDLGYWIESEKNDT | 76.47%  |
| AMD16557_Zika_virus             | 191–207            | AVHSDLGYWIESEKNDT | 76.47%  |

**Table S2.** Epitope analysis of conservancy in different strains of DENV, ZIKV, YFV, JEV and WNV strains.

| <b>2H5 and 4H1BC mAb</b>             |                 |   |          |
|--------------------------------------|-----------------|---|----------|
| Protein name                         | Positions       | Protein sub-sequence(s)                   | Identity |
| ABG75766_Dengue_virus_1              | 192-208         | AVHADMGYWIESEKNET                         | 82.35%   |
| ABG75761_Dengue_virus_1              | 192-208         | AVHADMGYWIESEKNET                         | 82.35%   |
| AFN54943_Dengue_virus_1              | 192-208         | AVHADMGYWIESEKNET                         | 82.35%   |
| AIE17400_Dengue_virus_2              | 192-208         | AVHADMGYWIESALNDT                         | 100.00%  |
| ABK51383_Dengue_virus_2              | 192-208         | AVHADMGYWIESALNDT                         | 100.00%  |
| AFZ40226_Dengue_virus_2              | 192-208         | AVHADMGYWIESALNDT                         | 100.00%  |
| ADM63678_Dengue_virus_3              | 191-207         | AVHADMGYWIESQKNGS                         | 76.47%   |
| AAT79552_Dengue_virus_3              | 191-207         | AVHADMGYWIESQKNGS                         | 76.47%   |
| ALI16137_Dengue_virus_3              | 191-207         | AVHADMGYWIESQKNGS                         | 76.47%   |
| AGI95993_Dengue_virus_4              | 191-207         | AVHADMGYWIESSKNQT                         | 82.35%   |
| ALB78116_Dengue_virus_4              | 192-208         | AVHADMGYWIESSKNQT                         | 82.35%   |
| AFD53008_Dengue_virus_4              | 191-207         | AVHADMGYWIESSKNQT                         | 82.35%   |
| AMR39836_Zika_virus                  | 191-207         | AAHSDLGYWIESEKNDT                         | 70.59%   |
| AMD61710_Zika_virus                  | 191-207         | AVHSDLGYWIESEKNDT                         | 76.47%   |
| ASK51714_Zika_virus                  | 193-209         | AVHSDLGYWIESEKNDT                         | 76.47%   |
| ARB07991_Zika_virus                  | 193-209         | AVHSDLGYWIESEKNDT                         | 76.47%   |
| ARB07978_Zika_virus                  | 193-209         | AVHSDLGYWIESEKNDT                         | 76.47%   |
| AMD16557_Zika_virus                  | 191-207         | AVHSDLGYWIESEKNDT                         | 76.47%   |
| ARQ19026_Yellow_fever_virus          | 171-187,203-219 | AVFEYTMDCDGSILGAA,<br>GSHEVNGTWMIHLETLETL | 23.53%   |
| ARM37843_Yellow_fever_virus          | 171-187,203-219 | AVFEYTMDCDGSILGAA,<br>GSHEVNGTWMIHLETLETL | 23.53%   |
| ARM37842_Yellow_fever_virus          | 171-187,203-219 | AVFEYTMDCDGSILGAA,<br>GSHEVNGTWMIHLETLETL | 23.53%   |
| AAA21436_Japanese_encephalitis_virus | 193-209         | AVHSDLSYWIESRYNDT                         | 70.59%   |
| AAA81554_Japanese_encephalitis_virus | 193-209         | AVHSDLSYWIESRYNDT                         | 70.59%   |
| ADT63077_Japanese_encephalitis_virus | 193-209         | AVHSDLSYWIESRFNDT                         | 70.59%   |
| ABC49716_West_Nile_virus             | 193-209         | AVHSDLSYWIESGLNDT                         | 76.47%   |
| AIY22515_West_Nile_virus             | 193-209         | AIHSDLSYWIESRLNDT                         | 70.59%   |
| AFX61606_West_Nile_virus             | 193-209         | AIHSDLSYWIESRLNDT                         | 70.59%   |