**Supplementary Information for**

A recombinant protein containing influenza viral conserved epitopes and superantigen induces broad-spectrum protection

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**This PDF file includes:**

Supplementary File 1a and 1b

**Supplementary File 1a**. Neutralizing antibody titers detected by standard HI

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Immunization | | Serum dilution(1/X) | | | |
| H1N1 | H3N2 | Victoria | Yamagata |
| Day14 | NMHC | < 1:8 | < 1:8 | < 1:8 | < 1:8 |
| NMH | < 1:8 | < 1:8 | < 1:8 | < 1:8 |
| SEC2 | < 1:8 | < 1:8 | < 1:8 | < 1:8 |
| NMH+SEC2 | < 1:8 | < 1:8 | < 1:8 | < 1:8 |
| PBS | < 1:8 | < 1:8 | < 1:8 | < 1:8 |
| QIV | 1:128 | 1:16 | 1:64 | 1:32 |
|  |  |  |  |  |  |
| Day28 | NMHC | < 1:8 | < 1:8 | < 1:8 | < 1:8 |
| NMH | < 1:8 | < 1:8 | < 1:8 | < 1:8 |
| SEC2 | < 1:8 | < 1:8 | < 1:8 | < 1:8 |
| NMH+SEC2 | < 1:8 | < 1:8 | < 1:8 | < 1:8 |
| PBS | < 1:8 | < 1:8 | < 1:8 | < 1:8 |
| QIV | 1:256 | 1:256 | 1:256 | 1:256 |
|  |  |  |  |  |  |
| Day42 | NMHC | < 1:8 | < 1:8 | < 1:8 | < 1:8 |
| NMH | < 1:8 | < 1:8 | < 1:8 | < 1:8 |
| SEC2 | < 1:8 | < 1:8 | < 1:8 | < 1:8 |
| NMH+SEC2 | < 1:8 | < 1:8 | < 1:8 | < 1:8 |
| PBS | < 1:8 | < 1:8 | < 1:8 | < 1:8 |
| QIV | 1:256 | 1:25 | 1:512 | 1:256 |

Quadrivalent influenza vaccine (QIV) was regarded as positive control.

**Supplementary File 1b.** ELISA endpoint titers of HAs or split virion

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Vaccine | Mouse | Titer against | | | | | | | | | |
| H1N1 | | | H3N2 | | | H2N2 | H5N1 | H7N9 | H9N2 |
| IgG | IgG1 | IgG2a | IgG | IgG1 | IgG2a | IgG | IgG | IgG | IgG |
| NMHC | No.1 | 3200 | 1600 | 400 | 3200 | 1600 | 400 | 8192 | 8192 | 8192 | 8192 |
| No.2 | 6400 | 3200 | 400 | 3200 | 1600 | 200 | 8192 | 8192 | 8192 | 8192 |
| No.3 | 6400 | 3200 | 800 | 3200 | 800 | 200 | 4096 | 8192 | 8192 | 8192 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| NMH | No.1 | 1600 | 1600 | 100 | 400 | 400 | 200 | 8192 | 2048 | 2048 | 4096 |
| No.2 | 1600 | 1600 | 100 | 400 | 400 | 200 | 8192 | 4096 | 2048 | 4096 |
| No.3 | 1600 | 1600 | 100 | 400 | 400 | 200 | 4096 | 4096 | 2048 | 8192 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| SEC2 | No.1 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 |
| No.2 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 |
| No.3 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| NMH  +SEC2 | No.1 | 6400 | 3200 | 100 | 1600 | 1600 | 100 | 8192 | 8192 | 4096 | 8192 |
| No.2 | 6400 | 3200 | 100 | 3200 | 3200 | 100 | 8192 | 8192 | 4096 | 8192 |
| No.3 | 6400 | 6400 | 100 | 3200 | 3200 | 200 | 8192 | 4096 | 4096 | 8192 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| PBS | No.1 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 |
| No.2 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 |
| No.3 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 | ＜10 |