

Table S5. Cross hemagglutination inhibition (HI) titers representing influenza A viruses from the antigenic map and antigenic distance analysis.

| Antigen name                    | Antigen passage | A/PERTH/16/2009 | A/PERTH/16/2009 | A/VICTORIA/361/2011 | A/VICTORIA/361/2011 | A/SWITZERLAND/9715293/2013 | A/SWITZERLAND/9715293/2013 | A/HONG KONG/4801/2014 | A/HONG KONG/4801/2014 | A/SWINE/MISSOURI/A01410819/2014 | A/SWINE/MISSOURI/A01410819/2014 | A/SWINE/INDIANA/A02430356/2019 | A/SWINE/INDIANA/A02430356/2019 |
|---------------------------------|-----------------|-----------------|-----------------|---------------------|---------------------|----------------------------|----------------------------|-----------------------|-----------------------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|
| A/PERTH/16/2009                 | E2              | 1280            | 1280            | 1810                | 905                 | 640                        | 160                        | 160                   | 80                    | 80                              | 57                              | *                              | *                              |
| A/VICTORIA/361/2011             | E2              | 1280            | 1280            | 3620                | 2560                | 640                        | 320                        | 80                    | 80                    | 113                             | 40                              | *                              | *                              |
| A/SWITZERLAND/9715293/2013      | MDCK2           | 640             | 1280            | 780                 | 780                 | 3121                       | 1560                       | 101                   | 101                   | *                               | *                               | 320                            | 320                            |
| A/HONG KONG/4801/2014           | MDCK2           | 320             | 320             | 226                 | 381                 | 381                        | 226                        | 1613                  | 1613                  | 113                             | 57                              | 320                            | 320                            |
| A/SWINE/MISSOURI/A01410819/2014 | MDCK2           | 80              | 160             | 53                  | 80                  | 139                        | 92                         | 25                    | 16                    | 5120                            | 2229                            | 320                            | 640                            |
| A/SWINE/OHIO/16TOSU4788/2016    | MDCK2           | 113             | 160             | 160                 | 160                 | 160                        | 113                        | 40                    | 20                    | 2560                            | 1280                            | *                              | *                              |
| A/SWINE/OHIO/A01354299/2017     | MDCK2           | 160             | 320             | 538                 | 538                 | 320                        | 190                        | 50                    | 32                    | *                               | *                               | 320                            | 80                             |
| A/SWINE/OKLAHOMA/A02218157/2017 | MDCK2           | 320             | 640             | 381                 | 381                 | 761                        | 538                        | 127                   | 127                   | 160                             | 160                             | 640                            | 320                            |
| A/SWINE/INDIANA/A02430356/2019  | MDCK2           | *               | *               | 320                 | 160                 | 160                        | 640                        | 160                   | 160                   | 160                             | 40                              | 640                            | 1280                           |

\*Not tested

E (strain grown in egg), MDCK (strain grown in Madin-Darby Canine Kidney cell line with local passage numbers).