Table S1. The SNRs of sera from vaccinated chicken with different subtypes of AIV detected by peptide microarray

| Serotype                                      | SNRs (Mean±SD) |
|-----------------------------------------------|----------------|
|                                               | H7-1  | H7-2  | H7-3  | H7-4  | H7-6  | H7-7  | H7-8  | H7-9  | H7-10 | H7-12 | H7-13 | H7-14 | H7-15 |
|                                               | 340-359aa | 350-369aa | 360-379aa | 370-389aa | 390-409aa | 400-419aa | 410-419aa | 420-439aa | 430-449aa | 450-469aa | 460-479aa | 470-489aa | 480-499aa |
| Mock                                          | 0.08±0.04* | 0.44±0.27 | 0.61±0.1 | 0.15±0.04 | 0.11±0.02 | 0.08±0.05 | 0.05±0.01 | 0.61±0.01 | 0.23±0.08 | 0.21±0.11 | 0.07±0.03 | 0.16±0.06 | 0.35±0.08 |
| A/Duck/Eastern China/103/03 (H1N1)           | 4.39±1.5 | 1.15±0.27 | 0.4±0.03 | 1.48±0.24 | 0.08±0.02 | 0.90±0.02 | 2.24±0.41 | 1.31±0.1 | 0.96±0.39 | 1.16±0.09 | 1.29±0.38 | 1.63±0.5 | 0.26±0.08 |
| A/Duck/Eastern China/852/03 (H3N2)           | 1.51±0.23 | 1.94±0.06 | 0.85±0.6 | 0.67±0.35 | 1.46±0.15 | 0.50±0.44 | 2.58±1.27 | 0.87±0.39 | 2.40±0.3 | 1.03±0.4 | 0.66±0.19 | 3.09±0.15 | 0.41±0.14 |
| A/Duck/Eastern China/160/02 (H4N6)           | 1.35±0.34 | 2.38±0.51 | 0.23±0.02 | 1.03±0.7 | 1.27±0.92 | 4.42±3.96 | 4.79±2.39 | 7.00±1.66 | 1.08±0.68 | 0.78±0.5 | 0.43±0.05 | 2.34±0.81 | 6.50±0.98 |
| A/Mallard/Huadong/S/2005 (H5N1)              | 0.81±0.04 | 2.27±0.95 | 0.83±0.05 | 1.02±0.54 | 1.04±0.28 | 2.30±0.16 | 2.32±0.79 | 3.42±0.16 | 8.51±1.37 | 1.31±0.01 | 0.02±0.02 | 3.92±2.38 | 1.49±0.22 |
| A/Chicken/Huadong/1111/16 (H5N6)             | 0.74±0.22 | 3.89±0.29 | 0.93±0.06 | 2.37±0.3 | 2.49±0.24 | 0.93±0.61 | 3.19±0.04 | 0.73±0.58 | 0.34±0.11 | 0.75±0.5 | 2.75±0.69 | 2.13±0.25 | 0.95±0.2 |
| A/Chicken/Huadong/ZJ0104/16 (H5N2)           | 0.45±0.18 | 0.91±0.65 | 0.48±0.35 | 0.73±0.3 | 1.52±1.15 | 1.17±0.29 | 3.47±2.44 | 0.20±0.02 | 1.41±0.09 | 1.05±0.5 | 0.16±0.03 | 2.41±1.34 | 2.22±1.64 |
| A/Duck/Eastern China/58/03 (H6H2)            | 1.4±0.39 | 3.29±0.06 | 0.54±0.01 | 0.89±0.01 | 1.29±0.16 | 0.54±0.23 | 1.30±0.33 | 4.24±0.56 | 0.12±0.03 | 1.17±0.1 | 3.77±1.39 | 3.43±0.03 | 1.74±0.64 |
| A/Chicken/Jiangsu/1/1/2/17 (H7N9)            | 7.21±0.58 | 6.81±0.68 | 0.10±0.04 | 2.40±1.92 | 0.98±0.07 | 3.67±2.21 | 0.73±0.2 | 0.82±0.25 | 0.79±0.27 | 5.32±0.35 | 5.72±0.54 | 2.47±0.37 | 1.10±0.06 |
| A/Chicken/Jiangsu/XJ05/14 (H7N9)             | 5.81±0.19 | 1.65±0.21 | 1.52±0.38 | 0.83±0.04 | 0.98±0.68 | 1.5±1.14 | 1.74±0.55 | 0.73±0.33 | 1.58±0.47 | 5.06±0.53 | 4.30±1.06 | 3.20±0.75 | 0.51±0.02 |
| A/Chicken/Jiangsu/W1-8-15/17 (H7N9)         | 1.64±0.35 | 2.33±0.12 | 7.68±1.1 | 0.92±0.3 | 1.13±0.43 | 3.05±1.87 | 2.11±0.37 | 1.79±0.58 | 2.41±0.24 | 4.8±0.45 | 2.92±1.19 | 4.17±0.08 | 1.31±0.56 |
| A/Chicken/Huadong/JD/7/17 (H7N9)             | 3.12±0.86 | 3.93±0.67 | 0.93±0.06 | 0.95±0.47 | 2.26±0.4 | 2.55±0.15 | 4.87±3.44 | 2.47±0.97 | 1.36±0.3 | 5.90±0.39 | 4.85±2.12 | 3.11±0.74 | 1.09±0.01 |
| A/Chicken/Shanghai/F/98 (H9N2)               | 3.78±0.86 | 2.21±0.62 | 3.89±0.64 | 0.67±0 | 0.86±0.33 | 1.29±0.83 | 2.98±0.04 | 0.78±0.12 | 2.12±0.1 | 0.59±0.2 | 1.30±0.28 | 8.53±1 | 1.10±0.24 |
| A/Chicken/Fujian/SN/14 (H9N2)                | 2.11±0.45 | 1.85±0.16 | 1.57±0.45 | 2.12±0.14 | 1.57±0.09 | 1.92±0.65 | 1.77±0.1 | 1.15±0.09 | 1.76±0.16 | 0.8±0.25 | 1.15±0.1 | 6.14±0.2 | 1.90±0.26 |
| A/Chicken/Huadong/RDS/13 (H10N9)             | 3.31±0.96 | 1.94±0.72 | 0.42±0.02 | 0.85±0.3 | 1.13±0.27 | 0.86±0.13 | 1.50±0.14 | 1.67±0.23 | 0.29±0.19 | 1.21±0.11 | 0.90±0.2 | 9.54±4.67 | 0.95±0.32 |
| A/Duck/Eastern China/96/06/02 (H11N2)        | 2.02±0.35 | 1.08±0.01 | 0.67±0.37 | 1.44±0.36 | 1.15±0.11 | 0.76±0.16 | 2.56±0.97 | 1.35±0.32 | 0.25±0.12 | 1.05±0.15 | 5.35±0.52 | 3.86±2.28 | 0.75±0.05 |

*cut-off values. SNRs ≥2 is positive, SNRs < 2 is negative.
# Table S2 The proportion of the 12 peptide with different patterns in H7N9 AIV

| H7N9 | H7-12 peptide | H3 insert | others | Sample size |
|------|---------------|-----------|--------|-------------|
|      | 468N | 471F | 473K | 474T | 476K | 468N-476K |       |            |
| LPAIV | 2484 | 115 | 0 | 0 | 47 | 0 | 22 | 2668 |
| HPAIV | 167 | 30 | 0 | 0 | 10 | 0 | 3 | 210 |
| sum | 2651 | 145 | 0 | 0 | 57 | 0 | 25 | 2878 |