**Supplementary Table 1**

The signal intensity (Log 2) of serum antibodies responses against spike peptides in different vaccinated mice.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Name | Sequence | Vacc1  | Vacc2 | Vacc3 | Vacc4 | Vacc5 | Vacc6 |
| S1-4 | 19 TTRTQLPPAYTN 30 |  |  |  | 7 |  |  |
| S1-8 | 43 FRSSVLHSTQDL 54 |  |  |  |  | 8 |  |
| S1-23 | 133 FQFCNDPFLGVY 144 |  |  |  | 8 |  |  |
| S1-24 | 139 PFLGVYYHKNNK 150 | 8 |  |  |  |  |  |
| S1-55 | 325 SIVRFPNITNLC 336 |  |  |  | 7 |  |  |
| S1-57 | 337 PFGEVFNATRFA 348 |  |  |  |  | 8 |  |
| S1-60 | 355 RKRISNCVADYS 366 |  |  | 8 |  |  |  |
| S1-76 | 451 YLYRLFRKSNLK 462 |  | 7 |  |  |  |  |
| S1-88 | 523 TVCGPKKSTNLV 534 |  |  |  | 7 |  |  |
| S1-96 | 571 DTTDAVRDPQTL 582 |  |  | 8 |  |  |  |
| S1-101 | 601 GTNTSNQVAVLY 612 |  |  |  | 10 |  |  |
| S1-102 | 607 QVAVLYQDVNCT 618 | 8 |  |  |  |  |  |
| S1-103 | 613 QDVNCTEVPVAI 624 |  |  |  |  |  | 8 |
| S2-21 | 806 LPDPSKPSKRSF 817 |  |  | 7 |  |  |  |
| S2-22 | 812 PSKRSFIEDLLF 823 | 7 |  | 10 | 9 | 6 | 11 |
| S2-23 | 818 IEDLLFNKVTLA 829 | 7 |  |  | 8 |  | 7 |
| S2-28 | 848 DLICAQKFNGLT 859 | 10 |  |  |  |  |  |
| S2-33 | 878 LAGTITSGWTFG 889 |  |  |  | 7 |  |  |
| S2-34 | 884 SGWTFGAGAALQ 895 |  |  |  | 10 |  |  |
| S2-35 | 890 AGAALQIPFAMQ 901 | 10 |  |  |  |  |  |
| S2-46 | 956 AQALNTLVKQLS 967 |  |  |  | 6 |  |  |
| S2-49 | 974 SSVLNDILSRLD 985 |  |  |  | 6 |  |  |
| S2-52 | 992 QIDRLITGRLQS 1003 |  | 9 |  |  |  |  |
| S2-76 | 1136 TVYDPLQPELDS 1147 | 10 | 7 |  |  | 8 | 8 |
| S2-83 | 1178 NIQKEIDRLNEV 1189 | 8 | 8 |  | 13 | 12 |  |
| S2-87 | 1202 ELGKYEQYIKWP 1213 |  |  |  |  | 10 |  |