

Table S1 – Antibody titer analysis for Re-Vaccinated (RV) donors

| No | IgM, CP | IgA, CP | IgG, BAU/ ml | Ncc, IgG, CP | Date of Vaccina- tion | Date of Re- Vaccina- tion | Date of Blood Sampling | Days between Vac. and Re-Vac. | Days before Blood Sam- pling |
|----|------------|------------|--------------------|--------------------|-----------------------------|------------------------------------|------------------------------|---|--|
| 2 | 0.1 | 0.1 | 28.3 | 0.2 | 02.21 | 08.21 | 08.10.21 | 180 | 60 |
| 3 | 0.3 | 6.8 | 1023 | 0.2 | 21.04.21 | 27.10.21 | 19.11.21 | 185 | 21 |
| 4 | 0.2 | 4.5 | 1022 | 0.4 | 02.03.21 | 16.08.21 | 19.11.21 | 165 | 93 |
| 5 | 0.2 | 0.1 | 86 | 0.3 | 29.04.21 | 16.08.21 | 18.11.21 | 102 | 92 |
| 6 | 0.1 | 0.3 | 188.2 | 0.2 | 05.04.21 | 07.10.21 | 18.11.21 | 182 | 41 |
| 7 | 0.1 | 1.2 | 264.4 | 0.2 | xx.12.20 | xx.07.21 | 08.10.21 | 210 | 90 |
| 8 | 0.8 | 1.7 | 857 | 0.6 | 15.03.21 | 17.09.21 | 18.11.21 | 182 | 61 |
| 9 | 0.2 | 2.6 | 1022 | 0.3 | 26.03.21 | 09.2021 | 30.11.21 | 170 | 60 |
| 14 | 0.2 | 0.8 | 75 | 0.2 | 15.04.21 | 27.09.21 | 23.11.21 | 162 | 56 |
| 15 | 0.1 | 1.5 | 181 | 0.2 | 01.03.21 | 01.09.21 | 23.11.21 | 180 | 82 |
| 16 | 0.1 | 0.3 | 99 | 0.2 | 01.03.21 | 01.09.21 | 23.11.21 | 180 | 82 |
| 17 | 0.1 | 3.0 | 50 | 0.3 | 09.04.21 | 18.10.21 | 23.11.21 | 188 | 35 |
| 18 | 1.4 | 0.5 | 1696 | 0.2 | 03.03.21 | 06.09.21 | 23.11.21 | 183 | 77 |
| 19 | 0.1 | 1.1 | 440 | 0.2 | 01.02.21 | 06.08.21 | 23.11.21 | 185 | 105 |
| 21 | 0.2 | 0.5 | 2085 | 0.6 | 03.03.21 | 06.09.21 | 24.11.21 | 185 | 78 |

CP – coefficient of positivity; BAU – binding antibody units; Ncc – nucleocapsid protein of SARS-CoV-2

Table S2 – Antibody titer analysis for Re-Infected (RI) donors

| No | IgM, CP | IgA, CP | IgG, BAU/ ml | Ncc, IgG, CP | Date of PCR1+ Patient's Condition | Date of PCR2+ Patient's Condition | Date of Blood Sampling | Days between PCR1+ and PCR2+ | Days before Blood Sam- pling |
|----|------------|------------|--------------------|--------------------|--|--|------------------------------|--|--|
| 23 | 0.6 | 1.7 | 441 | 16.8 | 21.06.21 Severe | 13.10.21 Mild | 23.11.21 | 114 | 40 |
| 24 | 0.0 | 5.1 | 409 | 5.9 | 07.10.20 Moderate | 12.07.21 Moderate | 23.11.21 | 280 | 131 |
| 25 | 17.7 | 2.5 | 470 | 17.6 | 22.10.20 Mild | 25.10.21 Mild | 25.11.21 | 368 | 30 |
| 26 | 0.1 | 5.3 | 1072 | 2.4 | 11.09.20 Moderate | - Mild | 18.11.21 | - | - |
| 27 | 1.1 | 9.9 | 342 | 1.7 | 04.11.20 Moderate | - Mild | 18.11.21 | - | - |
| 28 | 0.3 | 1.9 | 98 | 8.3 | 16.11.20 Mild | 30.08.21 AS | 18.11.21 | 290 | 79 |
| 30 | 0.6 | 9.6 | 263.1 | 17.7 | 20.06.20 Moderate | 18.10.21 Moderate | | 430 | ? |
| 33 | 0.4 | 4.0 | 753 | 3.0 | 02.2020 N/A | 02.2021 N/A | 18.11.21 | 360 | 280 |
| 34 | 0.4 | 8.7 | 112 | 1.3 | 04.03.21 Moderate | 28.06.21 Mild | 25.11.21 | 114 | 150 |
| 35 | 0.1 | 1.0 | 57.8 | 1.2 | 13.10.20 Moderate | 21.06.21 Mild | 16.11.21 | 250 | 147 |
| 36 | 0.5 | 4.9 | 486 | 4.6 | 01.10.20 Moderate | - AS | 18.11.21 | - | - |
| 37 | 0.6 | 15.9 | 710 | 17.3 | 07.10.20 Moderate | 12.07.21 AS | 17.11.21 | 280 | 125 |
| 38 | 4.6 | 0.4 | 10 | 0.3 | 17.08.20 Mild | 26.10.21 AS | 23.11.21 | 430 | 27 |
| 82 | 7.4 | 16.8 | 2813 | 17.7 | 19.10.20 Moderate | 29.10.21 AS | 17.11.21 | 375 | 22 |

CP – coefficient of positivity; BAU – binding antibody units; Ncc – nucleocapsid protein of SARS-CoV-2; AS – asymptomatic; N/A – not available

Table S3 – Antibody titer analysis for Breakthrough Infected (BI) donors

| No | IgM, CP | IgA, CP | IgG, BAU/ ml | Ncc, IgG, CP | Date of Vaccina- tion | Date of PCR+ | Date of Blood Sampling | Days between Vac. and PCR+ | Days before Blood Sam- pling |
|----|------------|------------|--------------------|--------------------|-----------------------------|-----------------|------------------------------|--|--|
| 39 | 0.6 | 2.7 | 2123 | 17.7 | 20.07.21 | 13.09.21 | 18.11.21 | 53 | 65 |
| 40 | 0.7 | 11.7 | 4564 | 17.8 | 16.08.21 | 25.10.21 | 18.11.21 | 70 | 23 |
| 42 | 1.2 | 6.7 | 4220 | 4.8 | 15.05.21 | 11.10.21 | 25.11.21 | 68 | 45 |
| 43 | 0.6 | 0.8 | 202 | 0.8 | 09.06.21 | 30.06.21 | 23.11.21 | 140 | 143 |
| 44 | 0.4 | 8.9 | 475 | 13.8 | 10.06.21 | 05.07.21 | 18.11.21 | 25 | 132 |
| 45 | 2.0 | 15.2 | 4094 | 17.2 | 02.2021 | xx.11. 21 | - | - | - |
| 46 | 0.7 | 11.1 | 4985 | 17.2 | 26.02.21 | 18.10.21 | 17.11.21 | 235 | 30 |
| 47 | 0.2 | 0.5 | 485 | 2.2 | 21.04.21 | 17.06.21 | 17.11.21 | 56 | 150 |
| 48 | 1.1 | 6.0 | 16498 | 17.7 | 05.05.21 | 04.10.21 | 17.11.21 | 150 | 43 |
| 49 | 0.3 | 6.5 | 9450 | 4.1 | 21.04.21 | 25.10.21 | 17.11.21 | 184 | 22 |
| 50 | 0.5 | 6.0 | 2498 | 17.3 | 26.07.21 | 24.09.21 | 24.11.21 | 58 | 60 |
| 51 | 0.2 | 0.9 | 368 | 1.9 | 19.05.21 | 02.08.21 | 23.11.21 | 73 | 111 |
| 52 | 0.2 | 17.3 | 1182 | 16.4 | 09.03.21 | 20.07.21 | 24.11.21 | 131 | 124 |
| 53 | 0.5 | 9.0 | 1413 | 17.3 | 21.07.21 | 20.09.21 | 24.11.21 | 59 | 64 |
| 54 | 1.1 | 18.4 | 4989 | 16.7 | 22.03.21 | 01.11.21 | 24.11.21 | 230 | 23 |
| 55 | 4.5 | 11.3 | 4695 | 17.2 | 13.05.21 | 03.11.21 | 24.11.21 | 170 | 21 |
| 56 | 0.3 | 2.2 | 969 | 7.2 | 04.06.21 | 31.07.21 | 24.11.21 | 113 | 112 |
| 57 | 0.1 | 2.8 | 1028 | 9.0 | 21.07.21 | 30.08.21 | 24.11.21 | 39 | 84 |
| 58 | 0.3 | 3.1 | 1675 | 15.5 | 01.05.21 | 01.10.21 | 24.11.21 | 150 | 54 |
| 59 | 3.1 | 18.4 | 50890 | 17.7 | 05.05.21 | 20.10.21 | 24.11.21 | 165 | 34 |
| 60 | 0.4 | 4.6 | 3085 | 17.7 | 05.05.21 | 01.10.21 | 24.11.21 | 145 | 54 |
| 61 | 0.4 | 1.2 | 1753 | 7.1 | 13.07.21 | 06.08.21 | 19.11.21 | 23 | 103 |
| 84 | 0.2 | 3.2 | 1231 | 5.9 | 21.04.21 | 07.07.21 | 17.11.21 | 76 | 130 |
| 85 | 0.2 | 11.2 | 772 | 1.6 | 11.06.21 | 02.08.21 | 24.11.21 | 51 | 112 |

CP – coefficient of positivity; BAU – binding antibody units; Ncc – nucleocapsid protein of SARS-CoV-2

Table S4 – Antibody titer analysis for Vaccinated Convalescent (VC) donors

| № | IgM, CP | IgA, CP | IgG, BAU/ ml | Ncc, IgG, CP | Date of PCR+ | Date of Vaccina- tion | Date of Blood Sampling | Days between PCR+ and Vac. | Days before Blood Sam- pling |
|----|------------|------------|--------------------|--------------------|-----------------------|-----------------------------|------------------------------|--|--|
| 62 | 1.9 | 0.6 | 1418 | 13.3 | 16.09.20 | 16.08.21 | 18.11.21 | 330 | 92 |
| 63 | 0.3 | 4.1 | 8608 | 13.7 | 16.11.20 | 27.09.21 | 18.11.21 | 314 | 51 |
| 64 | 3.2 | 18.0 | 14129 | 14.6 | 10.11.20 | 06.09.21 | 18.11.21 | 296 | 72 |
| 65 | 0.6 | 16.9 | 2850 | 3.3 | 26.10.20 | 16.08.21 | 18.11.21 | 300 | 92 |
| 67 | 0.1 | 6.1 | 4434 | 1.7 | 21.10.20 | 21.09.20 | 18.11.21 | 330 | 57 |
| 68 | 1.1 | 16.6 | 4569 | 1.7 | 14.05.20 | xx.07.21 | 10.09.21 | 420 | 60 |
| 69 | 1.0 | 10.4 | 3042 | 3.0 | 30.10.20 | 16.08.21 | 18.11.21 | 286 | 92 |
| 70 | 0.6 | 9.2 | 474 | 1.1 | 04.11.20, 30.06.21 | 17.07.21 | 18.11.21 | 253 | 121 |
| 72 | 0.7 | 7.8 | 1190 | 5.9 | xx.10.20 | xx.06.21 | 17.11.21 | 240 | 150 |
| 83 | 1.3 | 1.7 | 827 | 3.9 | 26.10.20 | 17.07.21 | 18.11.21 | 251 | 121 |
| 75 | 0.4 | 12.0 | 733 | 0.7 | 11.09.20 | 16.08.21 | 18.11.21 | 335 | 92 |
| 76 | 1.3 | 5.0 | 731 | 0.4 | 10.09.20 | 16.08.21 | 18.11.21 | 336 | 92 |
| 80 | 0.4 | 8.9 | 2657 | 13.7 | 17.06.21 | 18.10.21 | 24.11.21 | 121 | 35 |
| 81 | 0.5 | 3.8 | 1087 | 0.8 | 18.11.20 | 06.09.21 | 24.11.21 | 288 | 78 |

CP – coefficient of positivity; BAU – binding antibody units; Ncc – nucleocapsid protein of SARS-CoV-2

Table S5 – Neutralization of virus variants by Re-Vaccinated (RV) donor sera (GMT ID50)

| № | Wu-1 | BA.1 | BA.4/5 |
|----|------|------|--------|
| 2 | 11 | 10 | 10 |
| 3 | 396 | 84 | 54 |
| 4 | 864 | 77 | 107 |
| 5 | 50 | 10 | 10 |
| 6 | 146 | 11 | 10 |
| 7 | 17 | 10 | 10 |
| 8 | 807 | 43 | 10 |
| 9 | 1582 | 84 | 33 |
| 14 | 53 | 10 | 10 |
| 15 | 42 | 10 | 10 |
| 16 | 105 | 10 | 10 |
| 17 | 232 | 168 | 15 |
| 18 | 899 | 122 | 37 |
| 19 | 387 | 52 | 13 |
| 21 | 2058 | 159 | 41 |

Table S6 – Neutralization of virus variants by Re-Infected (RI) donor sera (GMT ID50)

| № | Wu-1 | BA.1 | BA.4/5 |
|----|------|------|--------|
| 23 | 205 | 24 | 24 |
| 24 | 515 | 74 | 116 |
| 25 | 901 | 9 | 16 |
| 26 | 154 | 46 | 19 |
| 27 | 247 | 45 | 40 |
| 28 | 94 | 38 | 26 |
| 30 | 535 | 35 | 111 |
| 33 | 338 | 95 | 11 |
| 34 | 85 | 9 | 10 |
| 35 | 115 | 52 | 68 |
| 36 | 928 | 72 | 71 |
| 37 | 1936 | 15 | 76 |
| 82 | 2135 | 76 | 236 |

Table S7 – Neutralization of virus variants by Breakthrough Infected (BI) donor sera (GMT ID50)

| № | Wu-1 | BA1 | BA.4/5 |
|----|-------|-------|--------|
| 39 | 15398 | 107 | 96 |
| 40 | 5770 | 169 | 167 |
| 42 | 4531 | 280 | 671 |
| 43 | 53 | 10 | 10 |
| 44 | 209 | 44 | 33 |
| 45 | 3138 | 246 | 670 |
| 46 | 3161 | 320 | 562 |
| 47 | 658 | 61 | 37 |
| 48 | 10536 | 352 | 1440 |
| 49 | 8165 | 968 | 744 |
| 50 | 1346 | 126 | 152 |
| 53 | 1469 | 129 | 30 |
| 54 | 6834 | 1106 | 542 |
| 55 | 4079 | 589 | 690 |
| 56 | 875 | 242 | 61 |
| 57 | 1163 | 22 | 28 |
| 58 | 3476 | 174 | 288 |
| 59 | 72083 | 27370 | 32159 |
| 60 | 2215 | 504 | 172 |
| 61 | 776 | 55 | 10 |
| 84 | 44172 | ND | 1751 |
| 85 | 10380 | 45 | 206 |

Table S8 – Neutralization of virus variants by Vaccinated Convalescents (VC) donor sera (GMT ID50)

| № | Wu-1 | BA.1 | BA.4/5 |
|----|-------|------|--------|
| 62 | 1704 | 195 | 55 |
| 63 | 3915 | 2801 | 1679 |
| 64 | 6439 | 2120 | 1282 |
| 65 | 982 | 832 | 232 |
| 67 | 1351 | 1007 | 610 |
| 68 | 2231 | 699 | 541 |
| 69 | 1420 | 498 | 638 |
| 70 | 1917 | 488 | 143 |
| 72 | 10267 | 431 | 396 |
| 83 | 4405 | 66 | 57 |
| 75 | 770 | 279 | 108 |
| 76 | 1278 | 113 | 110 |
| 80 | 1731 | 286 | 109 |
| 81 | 14541 | 67 | 30 |