|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| MS-MS fragments | r.t | Parent ions | Unique Markers | variant |
| 284.172 (y2)+1, 447.236 (y3)+1 , 546.304 (y4)+1, 603.325 (y5)+1, 716.409 (y6)+1, 863.478 (y7)+1, 960.531 (y8)+1, 302.167 (y5)+2, 358.709 (y6)+2, 432.243 (y7)+2, 480.769 (y8)+2 | 6.5 | 682.6469 (M+3H)/3 | VCEFQFCNDPFLGVYHK  (P1-Spike) | Alpha  (UK) |
| 86.097 (imm of Ile), 120.081 (imm of Phe), 147.172 (y1)+1, 294.182 (y2)+1, , 652.367 (y6)+1, 765.451 (y7)+1, 866.499 (y8)+1, 1013.567 (y9)+1, 995.557 (y9 – H2O)+1, 261.160 (b2)+1, 362.208 (b3)+1, 507.288 (y9)+2 | 6.5 | 563.8295 (M+2H)/2 | IFTIGTVTFK  (P9-Orf3a) |
| 430.241(y4)+1, 343.209 (y3)+1, 246.157 (y2)+1, 175.119 (y1)+1, 413.215 (z4)+1, 326.183 (z3)+1, 412.231 (y4-H2O)+1, 325.199 (y3-H2O)+1, 413.215 (y4-NH3)+1, 395.204 (Z4-H2O)+1, 171.113 (b2), 258.145 (b3), 355.198 (b4), 143.118 (a4), 240.135 (b3-H2O)+, 355.198 (c3- NH3)+ , 272.167 (y5)+2, 215.625 (y4)+2,172.109 (y3)+2, 86.097 (Imm of Ile), 60.045 (Imm of Ser) | 3.2 | 600.3469  (M+H)  300.6773  (M+2H)/2 | GISPAR  (P1-N) | Beta  (South Africa) |
| 1511.558 (y14)+1, 1440.676 (y13)+1, 1158.543 (y10)+1, 1057.495 (y9)+1, 773.347 (y6)+1, 702.310 (y5)+1, 587.283 (y4)+1, 424.283 (y4)+1 129.066 (b1)+1, 242.150 (b2)+1, 313.188 (b3)+1, 756.360 (y14)+2 720.842 (y13)+2 | 4.8 | 876.9317  (M+2H)/2 | QIAPGQTGNIAQYNYK  (P5-Spike) |
| 1077.558 (y9)+1, 914.495 (y8)+1, 785.452 (y7)+1, 684.404 (y6)+1, 556.346 (y5)+1, 485.309 (y4)+1, 372.225 (y3)+1, 275.172 (y2)+1, 147.113 (y1)+1, 235.108 (b2-H2O)+1, 207.113 (a2)+1, 759.368 (b7-H2O)+, 646.284 (b6-H2O)+1, 575.247 (b5-H2O)+1, 447.188 (b4-H2O)+1 136.076 (Imm of Tyr), 984.479 (b9)+1 , 777.378 (b7)+1, 749.383 (a7)+1, 732.357 (a7-NH3)+1, 667.378 (Z6), 593.257 (b5)+1, 539.283 (y9)+2, 530.278 (y9-H2O)+2, 393.230 (y7)+2, 465.198 (b4)+1, 457.751 (y8)+2, 420.177 (a4-NH3)+ | 4.0 | 574.8014  (M+2H)/2 | AYETQALPQK  P13(N) | Delta  (India) |
| 1412.786 (y13)+1, 1313.718 (y12)+1, 1071.616 (y10)+1, 957.573 (y9)+1, 886.536 (y8)+1, 758.478 (y7)+1, 574.356 (y5)+1, 460.314 (y4)+1, 706.897 (y13)+2, 443.772 (y8)+2, 242.150 (b2)+1, 356.193 (b3)+1, 455.262 (b4)+1, 554.330 (b5)+1, 796.432 (b7)+1, 981.512 (b9)+1, 228.135 (b4)+2, 277.669 (b5)+2, 344.690 (b6)+2, 398.720 (b7)+2, 455.741 (b8)+2, 491.260 (b9)+2, 555.289 (b10)+2 | 5.9 | 934.0239  (M+2H)/2  623.0185  (M+3H)/3 | LQNVVNQNAQALNTLVK  P8 (Spike) |
| 1148.537 (y12)+1, 1047.489 (y11)+1, 950.437 (y10)+1, 863.415 (y9)+1, 806.383 (y8)+1, 719.351 (y7)+1, 588.311 (y6)+1, 430.241 (y4)+1, 343.209 (y3)+1, 175.120 (y1)+1, 618.288 (y13)+2, 574.772 (y12)+2, 524.249 (y11)+2, 202.083 (b2)+1, 303.130 (b3)+1 | 3.7 | 675.3098  (M+2H)/2 | NSTPGSSMGTSPAR  P12 (N) |
| 843.375 (y7)+1, 786.353 (y6)+1, 729.332 (y5)+1, 615.289 (y4)+1, 452.226 (y3)+1, 338.183 (y2)+1, 175.120 (y1)+1, 422.191 (y7)+2, 393.681 (y6)+2, 157.098 (b2)+1, 72.081 (Imm of Val), 136.076 (Imm of Tyr) | 3.6 | 471.7255  (M+2H)/2 | VGGNYNYR  P7 (Spike) |
| 186.088 (b2)+1, 169.061 ( b2-NH3), 243.109 (b3)+1,314.1778 (a4)+1, 342.178(b4)+1, 296.172 (a4-H2O), 411.236(a5)+1, 888.454(y8)+1, 871.427 (z8)+1, 791.401(y7)+1, 678.317(y6)+1, 494.265(y9)+2, 444.731(y8)+2 | 3.9 | 615.3158  (M+2H)/2 | GQGVPINTNSSR  (P14-N) | Gamma  (Brazil) |
| 1498.718(y14)+1, 1427.681(y13)+1, 1330.628(y12)+1, 1145.548(y10)+1, 1044.500(y9)+1, 987.479(y8)+1, 886.431(y7)+1, 773.347(y6)+1, 702.310(y5)+1, 587.283(y4)+1, 424.220(y3)+1, 310.177(y2)+1, 147.113(y1)+1, 242.150(b2)+1, 313.188(b3)+1, 595.320(b6)+1, 967.521(b10)+1, 749.863(y14)+2, 714.344(y13)+2, 136.076 (Imm of Tyr) | 4.8 | 870.4341  (M+2H)/2 | QIAPGQTGTIADYNYK  (P8-Spike) |
| 787.468(y8)+1, 700.436(y7)+1, 629.399(y6)+1, 515.356(y5)+1, 402.272(y4)+1, 331.234(y3)+1, 260.197(y2)+1, 147.113(y1)+1, 159.077(b2)+1, 344.157(b4)+1, 457.241(b5)+1, 212.103(b3-H20)+1,  555.325(a7-H20)+1, 394.238(y8)+2, 350.722(y7)+2, 86.097 (Imm of Leu), 60.045 (Imm of Ser) | 4.1 | 429.7563  (M+2H)/2 | ASANLAAIK  (P12-Spike) |
| 1256.627(y11)+1, 1143.543(y10)+1, 959.459(y8)+1, 725.358(y8)+1, 175.119(y1)+1, 628.818(y11)+2, 572.276(y10)+2, 230.114(b2)+1, 343.198(b3)+1, 136.076 (Imm of Tyr), 129.114(Imm of Arg) | 5.0 | 743.3707 | TQLPSAYTNSFTR  (P5-Spike) |

Table S3: Unique markers for SARS-Cov-2 variants identified by High resolution LC-MS/MS (Orbitrap)