

## CERTIFICATE OF ANALYSIS

<b>Product Name</b>	SARS-CoV-2 Spike Glycoprotein B.1.617.2-Delta
<b>Cat No.</b>	RP30033
<b>Lot No</b>	E9133222G
<b>Sequence</b>	See appendix for details
<b>Modification</b>	N/A
<b>Size</b>	Subpool 1: 3.95mg and Subpool 2: 3.925mg
<b>Storage</b>	-20°C
<b>Recommended Solvent*</b>	Dimethyl sulfoxide(Analytical grade)
<b>HPLC purity</b>	Crude
<b>Appearance</b>	White lyophilized powder
<b>Comments</b>	TFA salts

\*Note: Above recommended solvents for reference only. If there is any request for detailed dissolution conditions, we suggest you choose our 'Peptide Solubility Test Service'.

**Caution:**

For laboratory or further manufacturing use only. Not intended for household use. If you have any questions about the Certificate of Analysis, please contact our customer service representative at 1-877-436-7274 (TollFree), or 1-732-885-9188.

Certified by: *Tingting Cai*

Date: 07/19/2022

**Appendix:**

Subpool 1			
Sequence	MW	Quantity	Purity
MFVFLVLLPLVSSQC	1696.13	25ug	Crude
LVLLPLVSSQCVNLR	1654.04	25ug	Crude
PLVSSQCVNLRTRTQ	1701.95	25ug	Crude
SQCVNLRTRTQLPPA	1683.94	25ug	Crude
NLRTRTQLPPAYTNS	1731.92	25ug	Crude
RTQLPPAYTNSFTRG	1708.88	25ug	Crude
PPAYTNSFTRGVYYP	1732.90	25ug	Crude
TNSFTRGVYYPDKVF	1793.98	25ug	Crude
TRGVYYPDKVFRSSV	1773.99	25ug	Crude
YYPDKVFRSSVLHST	1799.00	25ug	Crude
KVFRSSVLHSTQDLF	1764.00	25ug	Crude
SSVLHSTQDLFLPFF	1737.96	25ug	Crude
HSTQDLFLPFFSNVT	1752.93	25ug	Crude

DLFLPFFSNVTFWHA	1841.08	25ug	Crude
PFFSNVTFWHAIHVS	1789.01	25ug	Crude
NVTFWHAIHVSGTNG	1639.78	25ug	Crude
FHAIHVSGTNGTKRF	1671.86	25ug	Crude
HVSGTNGTKRFDNPV	1628.75	25ug	Crude
TNGTKRFDNPVLPFN	1719.90	25ug	Crude
KRFDNPVLPFNDGVY	1780.98	25ug	Crude
NPVLPFNDGVYFAST	1640.80	25ug	Crude
PFNDGVYFASTEKSN	1675.76	25ug	Crude
GVYFASTEKSNIRG	1641.83	25ug	Crude
ASTEKSNIRGWIFG	1678.89	25ug	Crude
KSNIRGWIFGTLLD	1720.97	25ug	Crude
IRGWIFGTLLDSTQ	1722.95	25ug	Crude
IFGTLLDSTQSLLI	1636.89	25ug	Crude
TLDSKTQSLLIVNNA	1616.82	25ug	Crude
KTQSLLIVNNATNVV	1613.86	25ug	Crude
LLIVNNATNVVIKVC	1612.98	25ug	Crude
NNATNVVIKVCEFQF	1725.97	25ug	Crude
NVVIKVCEFQFCNDP	1755.03	25ug	Crude
KVCEFQFCNDPFLDV	1804.06	25ug	Crude
FQFCNDPFLDVYYHK	1936.16	25ug	Crude
NDPFLDVYYHKNNKS	1853.99	25ug	Crude
LDVYYHKNNKSWMES	1914.11	25ug	Crude
YHKNNKSWMESGVYS	1829.99	25ug	Crude
NKSWMESGVYSSANN	1673.77	25ug	Crude
MESGVYSSANNCTFE	1638.74	25ug	Crude
VYSSANNCTFEYVSQ	1711.81	25ug	Crude
ANNCTFEYVSQPFLM	1764.00	25ug	Crude
TFEYVSQPFLMDLEG	1775.98	25ug	Crude
VSQPFLMDLEGKQGN	1662.87	25ug	Crude
FLMDLEGKQGNFKNL	1754.02	25ug	Crude
LEGKQGNFKNLREFV	1779.01	25ug	Crude
QGNFKNLREFVFKNI	1854.13	25ug	Crude
KNLREFVFKNIDGYF	1890.15	25ug	Crude
EFVFKNIDGYFKIYS	1870.12	25ug	Crude
KNIDGYFKIYSKHTP	1811.05	25ug	Crude
GYFKIYSKHTPINLV	1780.08	25ug	Crude
IYSKHTPINLVRDLP	1766.06	25ug	Crude
HTPINLVRDLPQGFS	1693.91	25ug	Crude
NLVRDLPQGFSALEP	1655.86	25ug	Crude
DLPQGFSALEPLVDL	1613.81	25ug	Crude
GFSALEPLVDLPIGI	1540.81	25ug	Crude
LEPLVDLPIGINITR	1662.98	25ug	Crude
VDLPIGINITRFQTL	1700.00	25ug	Crude
IGINITRFQTLALH	1710.04	25ug	Crude
ITRFQTLALHRSYL	1832.16	25ug	Crude

QTLALHRSYLTPGD	1684.90	25ug	Crude
ALHRSYLTPGDSSSG	1547.63	25ug	Crude
SYLTPGDSSSGWTAG	1485.51	25ug	Crude
PGDSSSGWTAGAAAY	1397.41	25ug	Crude
SSGWTAGAAAYVGY	1523.61	25ug	Crude
TAGAAAYVGYLQPR	1600.78	25ug	Crude
AAYVGYLQPRTFLL	1775.06	25ug	Crude
VGYLQPRTFLLKYNE	1841.12	25ug	Crude
QPRTFLLKYNENGTI	1794.03	25ug	Crude
FLLKYNENGTITDAV	1697.89	25ug	Crude
YNENGTITDAVDCAL	1598.69	25ug	Crude
GTITDAVDCALDPLS	1490.64	25ug	Crude
DAVDCALDPLSETKC	1579.76	25ug	Crude
CALDPLSETKCTLKS	1608.88	25ug	Crude
PLSETKCTLKSFTVE	1682.94	25ug	Crude
TKCTLKSFTVEKGIY	1718.03	25ug	Crude
LKSFTVEKGIYQTSN	1714.92	25ug	Crude
TVEKGIYQTSNFRVQ	1769.96	25ug	Crude
GIYQTSNFRVQPTES	1726.85	25ug	Crude
TSNFRVQPTESIVRF	1780.99	25ug	Crude
RVQPTESIVRFPNIT	1757.01	25ug	Crude
TESIVRFPNITNLCP	1703.97	25ug	Crude
VRFPNITNLCPFGEV	1705.98	25ug	Crude
NITNLCPFGEVFNAT	1639.84	25ug	Crude
LCPFGEVFNATRFAS	1658.88	25ug	Crude
GEVFNATRFASVYAW	1717.89	25ug	Crude
NATRFASVYAWNRRKR	1840.06	25ug	Crude
FASVYAWNRRKRISNC	1815.07	25ug	Crude
YAWNRRKRISNCVADY	1859.08	25ug	Crude
RKRISNCVADYSVLY	1787.06	25ug	Crude
SNCVADYSVLYNSAS	1592.69	25ug	Crude
ADYSVLYNSASFSTF	1671.77	25ug	Crude
VLYNSASFSTFKCYG	1686.89	25ug	Crude
SASFSTFKCYGVSPT	1581.75	25ug	Crude
STFKCYGVSPTKLND	1659.87	25ug	Crude
CYGVSPTKLNDLCFT	1660.92	25ug	Crude
SPTKLNDLCFTNVYA	1685.90	25ug	Crude
LNDLCFTNVYADSFV	1720.90	25ug	Crude
CFTNVYADSFVIRGD	1706.88	25ug	Crude
VYADSFVIRGDEVRQ	1753.92	25ug	Crude
SFVIRGDEVRQIAPG	1643.85	25ug	Crude
RGDEVRQIAPGQTGK	1611.77	25ug	Crude
VRQIAPGQTGKIADY	1616.82	25ug	Crude
APGQTGKIADYNYKL	1638.83	25ug	Crude
TGKIADYNYKLPPDF	1759.92	25ug	Crude
ADYNYKLPPDFTGCV	1720.86	25ug	Crude

YKLPDDFTGCVIAWN	1741.97	25ug	Crude
DDFTGCVIAWNSNNL	1668.79	25ug	Crude
GCVIAWNSNNLDSKV	1619.81	25ug	Crude
AWNSNNLDSKVGNGY	1638.70	25ug	Crude
NNLDSKVGNGYNYRY	1776.87	25ug	Crude
SKVGNGYNYRYRLFR	1893.12	25ug	Crude
GNYNYRYRLFRKSNL	1964.20	25ug	Crude
YRYRLFRKSNLKPFE	2017.35	25ug	Crude
LFRKSNLKPFERDIS	1850.14	25ug	Crude
SNLKPFERDISTEY	1811.99	25ug	Crude
PFERDISTEYQAGS	1712.82	25ug	Crude
DISTEYQAGSKPCN	1625.76	25ug	Crude
EYQAGSKPCNGVEG	1551.68	25ug	Crude
AGSKPCNGVEGFNCY	1545.70	25ug	Crude
PCNGVEGFNCYFPLQ	1687.90	25ug	Crude
VEGFNCYFPLQSYGF	1770.97	25ug	Crude
NCYFPLQSYGFQPTN	1778.95	25ug	Crude
PLQSYGFQPTNGVGY	1627.76	25ug	Crude
YGFQPTNGVGYQPYR	1746.88	25ug	Crude
PTNGVGYQPYRVVVL	1661.91	25ug	Crude
VGYPYRVVLSFEL	1769.06	25ug	Crude
PYRVVLSFELLHAP	1740.06	25ug	Crude
VVLSFELLHAPATVC	1598.91	25ug	Crude
FELLHAPATVCGPKK	1610.93	25ug	Crude
HAPATVCGPKKSTNL	1523.76	25ug	Crude
TVCGPKKSTNLVKNK	1616.93	25ug	Crude
PKKSTNLVKNKCVNF	1720.05	25ug	Crude
TNLVKNKCVNFNFN	1711.95	25ug	Crude
KNKCVNFNFNGLTGT	1656.87	25ug	Crude
VNFNFNGLTGTGVL	1553.72	25ug	Crude
FNGLTGTGVLTESNK	1537.68	25ug	Crude
TGTGVLTESNKKFLP	1591.81	25ug	Crude
VLTESNKKFLPFQQF	1826.11	25ug	Crude
SNKKFLPFQQFGRDI	1825.08	25ug	Crude
FLPFQQFGRDIADTT	1755.93	25ug	Crude
QQFGRDIADTTDAVR	1692.79	25ug	Crude
RDIADTTDAVRDPQT	1673.74	25ug	Crude
DTTDAVRDPQTLEIL	1686.82	25ug	Crude
AVRDPQTLEILDITP	1680.91	25ug	Crude
PQTLEILDITPCSFG	1633.87	25ug	Crude
EILDITPCSFGVSV	1536.75	25ug	Crude
ITPCSFGVSVITPG	1434.66	25ug	Crude
SFGVSVITPGTNTS	1423.53	25ug	Crude
VSVITPGTNTSNQVA	1487.62	25ug	Crude
TPGTNTSNQVAVLYQ	1592.71	25ug	Crude
NTSNQVAVLYQGVNC	1609.77	25ug	Crude

QVAVLYQGVCNTEVP	1619.85	25ug	Crude
LYQGVNCTEVPVAIH	1642.88	25ug	Crude
VNCTEVPVAIHADQL	1608.82	25ug	Crude
EVPVAIHADQLTPTW	1676.87	25ug	Crude
AIHADQLTPTWRVYS	1757.95	25ug	Crude
DQLTPTWRVYSTGSN	1724.83	25ug	Crude
PTWRVYSTGSNVFQT	1742.89	25ug	Crude
Subpool 2			
Sequence	MW	Quantity	Purity
VYSTGSNVFQTRAGC	1589.74	25ug	Crude
GSNVFQTRAGCLIGA	1493.69	25ug	Crude
FQTRAGCLIGAEHVN	1615.82	25ug	Crude
AGCLIGAEHVNNSYE	1576.69	25ug	Crude
IGAEHVNNSECDIP	1660.77	25ug	Crude
HVNNSYECDIPIGAG	1588.70	25ug	Crude
SYECDIPIGAGICAS	1498.69	25ug	Crude
DIPIGAGICASYQTQ	1536.71	25ug	Crude
GAGICASYQTQTNSR	1556.66	25ug	Crude
CASYQTQTNSRRRAR	1797.96	25ug	Crude
QTQTNSRRRARSVAS	1717.85	25ug	Crude
NSRRRARSVASQSII	1700.91	25ug	Crude
RARSVASQSIIAYTM	1653.91	25ug	Crude
VASQSIIAYTMSLGA	1511.75	25ug	Crude
SIIAYTMSLGAENSV	1555.76	25ug	Crude
YTMSLGAENSVAYS	1606.72	25ug	Crude
LGAENSVAYSNNNSIA	1509.58	25ug	Crude
NSVAYSNNNSIAIPTN	1564.66	25ug	Crude
YSNNSIAIPTNFTIS	1641.78	25ug	Crude
SIAIPTNFTISVTTE	1593.78	25ug	Crude
PTNFTISVTTEILPV	1631.87	25ug	Crude
TISVTTEILPVSMTK	1619.93	25ug	Crude
TTEILPVSMTKTSVD	1621.86	25ug	Crude
LPVSMTKTSVDCTMY	1675.99	25ug	Crude
MTKTSVDCTMYICGD	1667.95	25ug	Crude
SVDCTMYICGDSTEC	1626.81	25ug	Crude
TMYICGDSTECNLL	1649.87	25ug	Crude
CGDSTECNLLQYG	1602.75	25ug	Crude
TECSNLLQYGSFCT	1678.89	25ug	Crude
NLLQYGSFCTQLNR	1770.03	25ug	Crude
QYGSFCTQLNRALTG	1658.84	25ug	Crude
FCTQLNRALTGIAVE	1635.89	25ug	Crude
LNRLALTGIAVEQDKN	1641.83	25ug	Crude
LTGIAVEQDKNTQEV	1644.79	25ug	Crude
AVEQDKNTQEVFAQV	1705.83	25ug	Crude
DKNTQEVFAQVKQIY	1811.01	25ug	Crude
QEVFAQVKQIYKTPP	1776.05	25ug	Crude

AQVKQIYKTPPIKDF	1776.09	25ug	Crude
QIYKTPPIKDFGGFN	1724.96	25ug	Crude
TPPIKDFGGFNFSQI	1667.87	25ug	Crude
KDFGGFNFSQILPDP	1681.85	25ug	Crude
GFNFSQILPDPSPKS	1633.81	25ug	Crude
SQILPDPSPSKRSF	1686.91	25ug	Crude
PDPSPSKRSFIEDL	1715.91	25ug	Crude
KPSKRSFIEDLLFNK	1822.12	25ug	Crude
RSFIEDLLFNKVTLA	1766.05	25ug	Crude
EDLLFNKVTLADAGF	1652.85	25ug	Crude
FNKVTLADAGFIKQY	1714.97	25ug	Crude
TLADAGFIKQYGDCL	1614.83	25ug	Crude
AGFIKQYGDCLGDIA	1570.77	25ug	Crude
KQYGDCLGDIAARDL	1637.82	25ug	Crude
DCLGDIAARDLICAQ	1576.80	25ug	Crude
DIAARDLICAQKFNG	1634.86	25ug	Crude
RDLICAQKFNGLTVL	1691.01	25ug	Crude
CAQKFNGLTVLPPL	1613.97	25ug	Crude
FNGLTVLPPLTDEM	1659.95	25ug	Crude
TVLPPLTDEMIAQY	1704.00	25ug	Crude
PLLTDEMIAQYTSAL	1665.91	25ug	Crude
DEMIAQYTSALLAGT	1583.77	25ug	Crude
AQYTSALLAGTITSG	1453.60	25ug	Crude
SALLAGTITSGWTFG	1481.66	25ug	Crude
AGTITSGWTFGAGAA	1367.47	25ug	Crude
TSGWTFGAGAALQIP	1476.64	25ug	Crude
TFGAGAALQIPFAMQ	1522.77	25ug	Crude
GAALQIPFAMQMAYR	1668.00	25ug	Crude
QIPFAMQMAYRFNGI	1787.12	25ug	Crude
AMQMAYRFNGIGVTQ	1686.96	25ug	Crude
AYRFNGIGVTQNVLY	1714.93	25ug	Crude
NGIGVTQNVLYENQK	1676.83	25ug	Crude
VTQNVLYENQKLIAN	1746.97	25ug	Crude
VLYENQKLIANQFNS	1780.98	25ug	Crude
NQKLIANQFNSAIGK	1645.87	25ug	Crude
IANQFNSAIGKIQDS	1605.76	25ug	Crude
FNSAIGKIQDSLST	1567.70	25ug	Crude
IGKIQDSLSTASAL	1490.66	25ug	Crude
QDSLSTASALGKLQ	1505.63	25ug	Crude
SSTASALGKLQNVVN	1488.65	25ug	Crude
SALGKLQNVVNQNAQ	1583.75	25ug	Crude
KLQNVVNQNAQALNT	1654.83	25ug	Crude
VVNQNAQALNTLVKQ	1639.86	25ug	Crude
NAQALNTLVKQLSSN	1600.78	25ug	Crude
LNTLVKQLSSNFQAI	1604.85	25ug	Crude
VKQLSSNFQAISSVL	1549.77	25ug	Crude

SSNFGAISSVLNDIL	1536.69	25ug	Crude
GAISSVLNDILSRDL	1572.77	25ug	Crude
SVLNDILSRDKVEA	1671.90	25ug	Crude
DILSRDKVEAEVQI	1727.96	25ug	Crude
RLDKVEAEVQIDRLI	1797.07	25ug	Crude
VEAEVQIDRLITGRL	1711.97	25ug	Crude
VQIDRLITGRLQSLQ	1740.02	25ug	Crude
RLITGRLQSLQTYVT	1749.03	25ug	Crude
GRLQSLQTYVTQQLI	1748.00	25ug	Crude
SLQTYVTQQLIRAAE	1720.93	25ug	Crude
YVTQQLIRAAEIRAS	1718.96	25ug	Crude
QLIRAAEIRASANLA	1596.84	25ug	Crude
AAEIRASANLAATKM	1517.76	25ug	Crude
RASANLAATKMSECV	1551.80	25ug	Crude
NLAATKMSECVLGQS	1551.79	25ug	Crude
TKMSECVLGQSKRVD	1680.95	25ug	Crude
ECVLGQSKRVDFCGK	1668.94	25ug	Crude
GQSKRVDFCGKGYHL	1694.92	25ug	Crude
RVDFCGKGYHLSFP	1757.05	25ug	Crude
CGKGYHLSFPQSAP	1622.87	25ug	Crude
YHLSFPQSAPHGVV	1669.91	25ug	Crude
SFPQSAPHGVVFLHV	1621.84	25ug	Crude
SAPHGVVFLHVTYVP	1622.87	25ug	Crude
GVVFLHVTYVPAQEK	1686.96	25ug	Crude
LHVTYVPAQEKNFTT	1747.95	25ug	Crude
YVPAQEKNFTTAPAI	1649.85	25ug	Crude
QEKNFTTAPAICHDG	1631.77	25ug	Crude
FTTAPAICHDGKAHF	1615.82	25ug	Crude
PAICHDGKAHFREG	1634.82	25ug	Crude
HDGKAHFREGVFVS	1682.84	25ug	Crude
AHFREGVFVSNATH	1654.79	25ug	Crude
REGVFVSNATHWFVT	1735.90	25ug	Crude
FVSNATHWFVTQRNF	1840.01	25ug	Crude
GTHWFVTQRNFYEPQ	1910.06	25ug	Crude
FVTQRNFYEPQIITT	1857.08	25ug	Crude
RNFYEPQIITDNTF	1859.01	25ug	Crude
EPQIITDNTFVSGN	1635.73	25ug	Crude
ITDNTFVSGNCDVV	1584.71	25ug	Crude
NTFVSGNCDVIGIV	1536.76	25ug	Crude
SGNCDVIGIVNNTV	1503.68	25ug	Crude
DVIGIVNNTVYDPL	1630.84	25ug	Crude
GIVNNTVYDPLQPEL	1671.85	25ug	Crude
NTVYDPLQPELDSFK	1765.92	25ug	Crude
DPLQPELDSFKEELD	1774.88	25ug	Crude
PELDSFKEELDKYFK	1888.09	25ug	Crude
SFKEELDKYFKNHTS	1873.04	25ug	Crude

ELDKYFKNHTSPDVD	1807.92	25ug	Crude
YFKNHTSPDVLGDI	1720.84	25ug	Crude
HTSPDVLGDISGIN	1539.61	25ug	Crude
DVDLGDISGINASVV	1473.59	25ug	Crude
GDISGINASVVNIQK	1514.69	25ug	Crude
GINASVVNIQKEIDR	1655.86	25ug	Crude
SVVNIQKEIDRLNEV	1755.98	25ug	Crude
IQKEIDRLNEVAKNL	1783.04	25ug	Crude
IDRLNEVAKNLNESL	1727.92	25ug	Crude
NEVAKNLNESLIDLQ	1699.87	25ug	Crude
KNLNESLIDLQELGK	1713.94	25ug	Crude
ESLIDLQELGKYEYQ	1827.99	25ug	Crude
DLQELGKYEYQIKWP	1910.14	25ug	Crude
LGKYEYQIKWPWYIW	2073.40	25ug	Crude
EYQIKWPWYIWLGFI	2042.39	25ug	Crude
KWPWYIWLGFIAGLI	1863.26	25ug	Crude
YIWLGFIAGLIAIVM	1680.11	25ug	Crude
GFIAGLIAIVMTIM	1549.00	25ug	Crude
GLIAIVMTIMLCCM	1611.18	25ug	Crude
IVMTIMLCCMTSCC	1651.21	25ug	Crude
TIMLCCMTSCCCLK	1640.14	25ug	Crude
CCMTSCCCLKGCCS	1531.94	25ug	Crude
SCCCLKGCCSCGSC	1443.77	25ug	Crude
CLKGCCSCGSCCKFD	1556.90	25ug	Crude
CCSCGSCCKFDEDDS	1601.74	25ug	Crude
GSCCKFDEDDSEPVL	1643.76	25ug	Crude
KFDEDDSEPVLKGVK	1705.87	25ug	Crude
DDSEPVLKGVKLHYT	1700.89	25ug	Crude