

Supplementary Materials

Table Legends

Table S1: Predicted CTL epitopes of SARS-CoV-2 protein.

Table S2: Predicted HTL epitopes of SARS-CoV-2 protein.

Table S3: Predicted LBL epitopes of SARS-CoV-2 protein.

Figure Legends

Figure S1: (A) Composition of the secondary structure from amino acid residues of vaccine construct, (B) Predicted secondary structure of vaccine construct by SOPMA server, (C) Predicted secondary structure of vaccine construct by PSIPRED server, and (D) Predicted cart of the vaccine construct by PSIPRED server.

Table S1: Predicted CTL epitopes of SARS-CoV-2 protein.

Epitope	Protein	Antigenicity	Allergenicity	Toxicity
YANRNRFLY	M	0.0256 (Probable NON-ANTIGEN)	Probable ALLERGEN	Non-Toxin
ATSRTLSTYY	M	0.6108 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
VATSRTLSTY	M	0.9457 (Probable ANTIGEN)	Probable ALLERGEN	Non-Toxin
WICLLQFAY	M	0.7317 (Probable ANTIGEN)	Probable ALLERGEN	Toxin
LVGLMWLSY	M	1.0633 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
YSRYRIGNY	M	0.3996 (Probable NON-ANTIGEN)	Probable ALLERGEN	Non-Toxin
AGDSGFAAY	M	0.9095 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
SSDNIALLV	M	0.3380 (Probable NON-ANTIGEN)	Probable ALLERGEN	Non-Toxin
SSSDNIALL	M	0.3755 (Probable NON-ANTIGEN)	Probable ALLERGEN	Non-Toxin
LLEQWNLVI	M	0.3649 (Probable NON-ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
LVKPSFYVY	E	0.4213 (Probable ANTIGEN)	Probable ALLERGEN	Non-Toxin
LTARRLCAY	E	0.7662 (Probable ANTIGEN)	Probable ALLERGEN	Non-Toxin
VSLVKPSFY	E	0.7476 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
VSEETGTLI	E	0.2570 (Probable NON-ANTIGEN)	Probable ALLERGEN	Non-Toxin

Table S2: Predicted HTL epitopes of SARS-CoV-2 protein.

Epitope	Protein	Antigenicity	IL4	IL10	Allergenicity	Toxicity
LSYYKLGASQRVAGD	M	0.2247 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
RTLSTYYKLGASQRVA	M	0.5644 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
SRTLSTYYKLGASQRV	M	0.5526 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
TLSYYKLGASQRVAG	M	0.4376 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
SYFIASFRLFARTRS	M	0.3751 (Probable NON-ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
YFIASFRLFARTRSM	M	0.3975 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
ASFRLFARTRSMWSF	M	0.7304 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
FIASFRLFARTRSMW	M	0.4072 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
IASRLFARTRSMWS	M	0.4424 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
SYKLGASQRVAGDS	M	0.0915 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
ANRNRFlyIIKLIFL	M	0.4812 (Probable ANTIGEN)	Non-Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
NRFlyIIKLIFLWLL	M	0.2109 (Probable NON-ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
NRNRFlyIIKLIFLW	M	0.3917 (Probable NON-ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
RNRFlyIIKLIFLWL	M	0.5114 (Probable ANTIGEN)	Non-Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
YANRNRFlyIIKLIF	M	0.3251 (Probable NON-ANTIGEN)	Non-Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
LACFVLAAYRINWI	M	1.2905 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
PVTLACFVLAAYRI	M	0.8548 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
VTLACFVLAAYRIN	M	1.0450 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
ACFVLAAYRINWIT	M	1.1115 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
TLACFVLAAYRINW	M	1.3132 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
LMWLSYFIASFRLF	M	0.1022 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
FRLFARTRSMWSFNP	M	0.8873 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
RFLYIIKLIFLWLLW	M	0.4833 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
SFRLFARTRSMWSFN	M	0.7955 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
YKLGASQRVAGDSG	M	0.2468 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
FLYIIKLIFLWLLWP	M	0.4200 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin

GLMWLSYFIASFRLF	M	0.0766 (Probable NON-ANTIGEN)	Non-Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
LSYFIASFRLFARTR	M	0.3427 (Probable NON-ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
MWLSYFIASFRLFAR	M	0.0043 (Probable NON-ANTIGEN)	Non-Inducer	Inducer	Probable ALLERGEN	Non-Toxin
LFARTRSMWSFNPET	M	0.9033 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
RLFARTRSMWSFNPE	M	0.7744 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
VGLMWLSYFIASFRL	M	0.6658 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
AVILRGHLRIAGHHL	M	0.1069 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
ILRGHLRIAGHHLGR	M	-0.0989 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
LRGHLRIAGHHLGRC	M	-0.1484 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
LYIIKLIFLWLLWPV	M	0.4288 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
VILRGHLRIAGHHLG	M	0.0809 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
KEITVATSRTLSYYK	M	0.5731 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
PKEITVATSRTLSYY	M	0.7003 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
LPKEITVATSRTLSY	M	0.5400 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
WLSYFIASFRLFART	M	0.0462 (Probable NON-ANTIGEN)	Non-Inducer	Inducer	Probable ALLERGEN	Non-Toxin
DLPKEITVATSRTLS	M	0.2410 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
KDLPKEITVATSRTL	M	0.1595 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
EITVATSRTLSYYKL	M	0.6002 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
ITVATSRTLSYYKLG	M	0.8002 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
CFVLAAYRINWITG	M	1.0062 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
FLTWICLLQFAYANR	M	0.7257 (Probable ANTIGEN)	Non-Inducer	Non-Inducer	Probable NON-ALLERGEN	Toxin
IGNYKLNTDHSSSSD	M	0.2892 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
RIGNYKLNTDHSSSS	M	0.2362 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
ETNILLNVPLHGTL	M	-0.1998 (Probable NON-ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
ESELVIGAVILRGHL	M	0.5735 (Probable ANTIGEN)	Inducer	Inducer	Probable ALLERGEN	Non-Toxin
AGDSGFAAYSRYRIG	M	0.9205 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
YKLNTDHSSSSDNIA	M	0.0685 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
VAGDSGFAAYSRYRI	M	0.6745 (Probable ANTIGEN)	Inducer	Inducer	Probable ALLERGEN	Non-Toxin

SGFAAYSRYRIGNYK	M	0.5817 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
NLVIGFLFLTWICLL	M	1.2609 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
NILLNVPLHGILTR	M	-0.0478 (Probable NON-ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
LAAVYRINWITGGIA	M	1.0581 (Probable ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
DSGFAAYSRYRIGNY	M	0.8741 (Probable ANTIGEN)	Inducer	Inducer	Probable ALLERGEN	Non-Toxin
NWITGGIAIAMAACLV	M	0.8988 (Probable ANTIGEN)	Non-Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
LLEQWNLVIGFLFLT	M	0.8471 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
LEQWNLVIGFLFTW	M	1.0231 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
NYKLNTDHSSSDNI	M	0.1970 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
EQWNLVIGFLFTWI	M	1.0549 (Probable ANTIGEN)	Non-Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
PLLESELVIGAVILR	M	0.7261 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
SELVIGAVILRGHLR	M	0.6768 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
GDSGFAAYSRYRIGN	M	0.8900 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
IFLWLLWPVTLACFV	M	0.6358 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
LESELVIGAVILRGH	M	0.6528 (Probable ANTIGEN)	Inducer	Inducer	Probable ALLERGEN	Non-Toxin
LLESELVIGAVILRG	M	0.5636 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
YIIKLIFLWLLWPVT	M	0.4298 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
YKLGASQRVAGDSGF	M	0.3250 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
YRIGNYKLNTDHSS	M	0.1572 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
LVIGFLFLTWICLLQ	M	1.0776 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Toxin
FAAYSRYRIGNYKLN	M	0.6185 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
GFAAYSRYRIGNYKL	M	0.6317 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
VIGAVILRGHLRIAG	M	0.4903 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
RGHLRIAGHHLGRCD	M	0.0223 (Probable NON-ANTIGEN)	Inducer	Non-Inducer	Probable ALLERGEN	Non-Toxin
LVTLAILTARRLCAY	E	0.8304 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
LLVTLAILTARRLCA	E	0.8706 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin

VTLAILTARRLCAYC	E	1.2832 (Probable ANTIGEN)	Non-Inducer	Non-Inducer	Probable NON-ALLERGEN	Non-Toxin
TLAILTARRLCAYCC	E	1.1538 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Toxin
FLLVTLAILTARRLC	E	1.1123 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
FYVYSRVKLNLSRV	E	0.6103 (Probable ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
IVNSVLLFLAFVVFL	E	0.2731 (Probable NON-ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
LIVNSVLLFLAFVVF	E	0.2925 (Probable NON-ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
NSVLLFLAFVVFLLV	E	0.4220 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
SVLLFLAFVVFLLV	E	0.5446 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
TLIVNSVLLFLAFVV	E	0.2903 (Probable NON-ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
VLLFLAFVVFLLVTL	E	0.6386 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
VNSVLLFLAFVVFL	E	0.3985 (Probable NON-ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
YVYSRVKLNLSRV	E	0.4492 (Probable ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
VFLLVTLAILTARRL	E	0.8883 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
PSFYVYSRVKLNLS	E	0.7986 (Probable ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
SFYVYSRVKLNLSR	E	0.6291 (Probable ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
IVNVSLVKPSFYVYS	E	0.6373 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable ALLERGEN	Non-Toxin
NIVNVSLVKPSFYVY	E	0.7680 (Probable ANTIGEN)	Inducer	Inducer	Probable ALLERGEN	Non-Toxin
VNVSLVKPSFYVYSR	E	0.7513 (Probable ANTIGEN)	Inducer	Inducer	Probable ALLERGEN	Non-Toxin
KPSFYVYSRVKLNLS	E	0.8229 (Probable ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin

AFVVFLVTLAILTA	E	0.6299 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
FLAFVVFLVTLAIL	E	0.7476 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
FVVFLVTLAILTAR	E	0.8896 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
LAILTARRLCAYCCN	E	1.1242 (Probable ANTIGEN)	Non-Inducer	Non-Inducer	Probable NON-ALLERGEN	Toxin
VVFLVTLAILTARR	E	1.0949 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
NVSLVKPSFYVYSRV	E	0.6449 (Probable ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
LAFVVFLVTLAILT	E	0.8229 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
LFLAFVVFLVTLAI	E	0.7471 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
LLFLAFVVFLVTLA	E	0.8122 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
YSRVKNLNSSRV PDL	E	0.7705 (Probable ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
VYSRVKNLNSSRV PD	E	0.5993 (Probable ANTIGEN)	Inducer	Inducer	Probable ALLERGEN	Non-Toxin
EETGLIVNSVLLFL	E	0.2055 (Probable NON-ANTIGEN)	Non-Inducer	Inducer	Probable ALLERGEN	Non-Toxin
VSLVKPSFYVYSRVK	E	0.7974 (Probable ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
LVKPSFYVYSRVKNL	E	0.7311 (Probable ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
VKPSFYVYSRVKNLN	E	1.2319 (Probable ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
ETGLIVNSVLLFLA	E	0.2236 (Probable NON-ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
SEETGLIVNSVLLF	E	0.1882 (Probable NON-ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
TGLIVNSVLLFLAF	E	0.3354 (Probable NON-ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
SRVKNLNSSRV PDL	E	0.7404 (Probable ANTIGEN)	Inducer	Inducer	Probable ALLERGEN	Non-Toxin

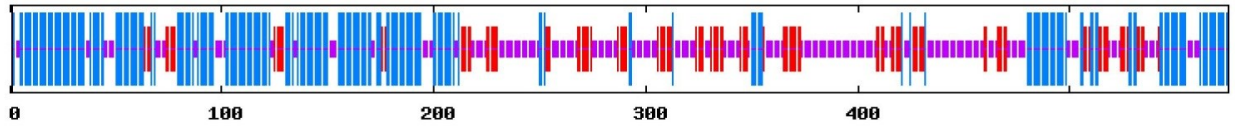
MYSFVSEETGTLIVN	E	0.2951 (Probable NON-ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
GTLIVNSVLLFLAFV	E	0.3383 (Probable NON-ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
CNIVNVSLVKPSFYV	E	0.8081 (Probable ANTIGEN)	Inducer	Inducer	Probable ALLERGEN	Non-Toxin
YSFVSEETGTLIVNS	E	0.3987 (Probable NON-ANTIGEN)	Inducer	Inducer	Probable ALLERGEN	Non-Toxin
CCNIVNVSLVKPSFY	E	0.8879 (Probable ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Toxin
SLVKPSFYVYSRVKN	E	0.6514 (Probable ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
AILTARRLCAYCCNI	E	1.1273 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Toxin
RRLCAYCCNIVNVSL	E	1.1971 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Toxin
ILTARRLCAYCCNIV	E	1.0817 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Toxin
YCCNIVNVSLVKPSF	E	0.9396 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Toxin
RLCAYCCNIVNVSLV	E	1.2823 (Probable ANTIGEN)	Non-Inducer	Inducer	Probable NON-ALLERGEN	Toxin
RVKNLNSSRVPDLLV	E	0.7925 (Probable ANTIGEN)	Inducer	Inducer	Probable ALLERGEN	Non-Toxin
VSEETGTLIVNSVLL	E	0.1951 (Probable NON-ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
SFVSEETGTLIVNSV	E	0.3658 (Probable NON-ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin
ARRLCAYCCNIVNVS	E	1.0866 (Probable ANTIGEN)	Non-Inducer	Non-Inducer	Probable ALLERGEN	Toxin
AYCCNIVNVSLVKPS	E	0.8053 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Toxin
LCAYCCNIVNVSLVK	E	0.8552 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Toxin
LTARRLCAYCCNIVN	E	1.1125 (Probable ANTIGEN)	Non-Inducer	Non-Inducer	Probable NON-ALLERGEN	Toxin
TARRLCAYCCNIVNV	E	0.9984 (Probable ANTIGEN)	Non-Inducer	Non-Inducer	Probable NON-ALLERGEN	Toxin

CAYCCNIVNVSLVKP	E	0.8337 (Probable ANTIGEN)	Inducer	Non-Inducer	Probable NON-ALLERGEN	Toxin
FVSEETGTLIVNSVL	E	0.1704 (Probable NON-ANTIGEN)	Inducer	Inducer	Probable NON-ALLERGEN	Non-Toxin

Table S3: Predicted LBL epitopes of SARS-CoV-2 protein.

Epitope	Protein	Allergenicity	Allergenicity	Toxicity
RSMWSFNPETNILLNV	M	0.4451 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
SFRLFARTRSMWSFNP	M	0.9510 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
RFLYIIKLIFLWLLWP	M	0.4532 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
GDSGFAAYSRYRIGNY	M	0.8980 (Probable ANTIGEN)	Probable ALLERGEN	Non-Toxin
HGTILTRPILLESEVI	M	0.2197 (Probable NON-ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
RCDIKDLPKEITVATS	M	0.5606 (Probable ANTIGEN)	Probable ALLERGEN	Non-Toxin
RGHLRIAGHHLGRCDI	M	0.0530 (Probable NON-ANTIGEN)	Probable ALLERGEN	Non-Toxin
RINWITGGIAIAMAACL	M	1.2392 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
PKEITVATSRTLSSYYK	M	0.5935 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
GIAIAMAACLVGLMWLS	M	0.9132 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
LVIGFLFTWICLLQF	M	0.9967 (Probable ANTIGEN)	Probable NON-ALLERGEN	Toxin
ACFVLAAYRINWITG	M	0.9714 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
RYRIGNYKLNTDHSSS	M	0.0786 (Probable NON-ANTIGEN)	Probable ALLERGEN	Non-Toxin
TVEELKKLLEQWNLVI	M	-0.0964 (Probable NON-ANTIGEN)	Probable ALLERGEN	Non-Toxin
SYKLGASQRVAGDSG	M	0.2129 (Probable NON-ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
DSNGTITVEELKKLLE	M	0.0790 (Probable NON-ANTIGEN)	Probable ALLERGEN	Non-Toxin
YKLNTDHSSSDNIAL	M	0.1815 (Probable NON-ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin

ACLVGLMWLSYFIASF	M	0.4075 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
LTWICLLQFAYANRNR	M	1.1530 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
LWPVTLACFVLAAYR	M	0.8961 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
MWLSYFIASFRLFART	M	0.0488 (Probable NON-ANTIGEN)	Probable ALLERGEN	Non-Toxin
PETNILLNVPLHGIL	M	-0.2635 (Probable NON-ANTIGEN)	Probable ALLERGEN	Non-Toxin
QFAYANRNRFLYIIKL	M	0.7140 (Probable ANTIGEN)	Probable ALLERGEN	Non-Toxin
TLAILTARRLCAYCCN	E	1.0519 (Probable ANTIGEN)	Probable NON-ALLERGEN	Toxin
NVSLVKPSFYVYSRVK	E	0.7865 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
YVYSRVKLNLSRVDP	E	0.5457 (Probable ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin
LCAYCCNIVNVSLVKP	E	0.7286 (Probable ANTIGEN)	Probable NON-ALLERGEN	Toxin
FVSEETGTLIVNSVLL	E	0.2099 (Probable NON-ANTIGEN)	Probable NON-ALLERGEN	Non-Toxin



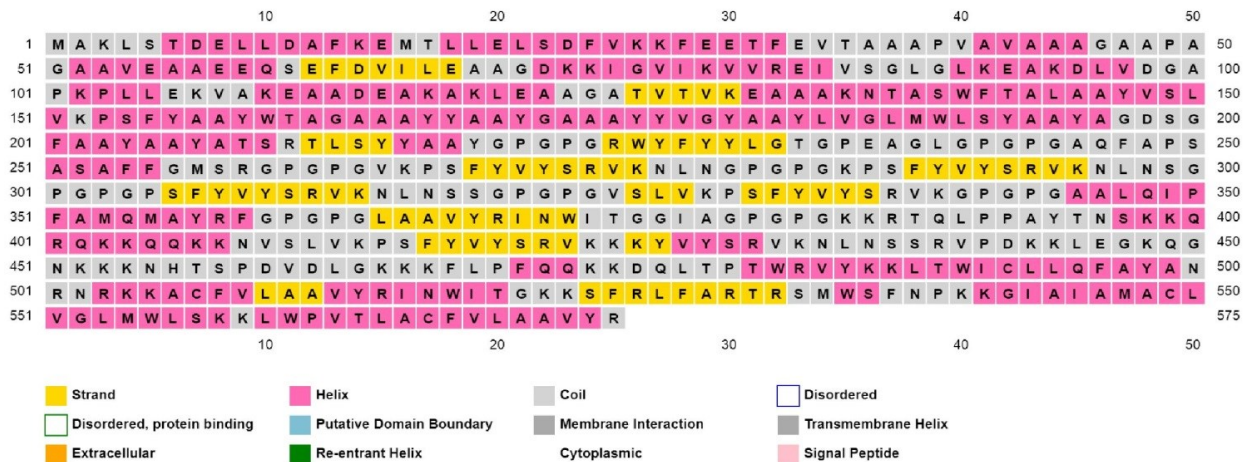
(A)

Sequence length : 575

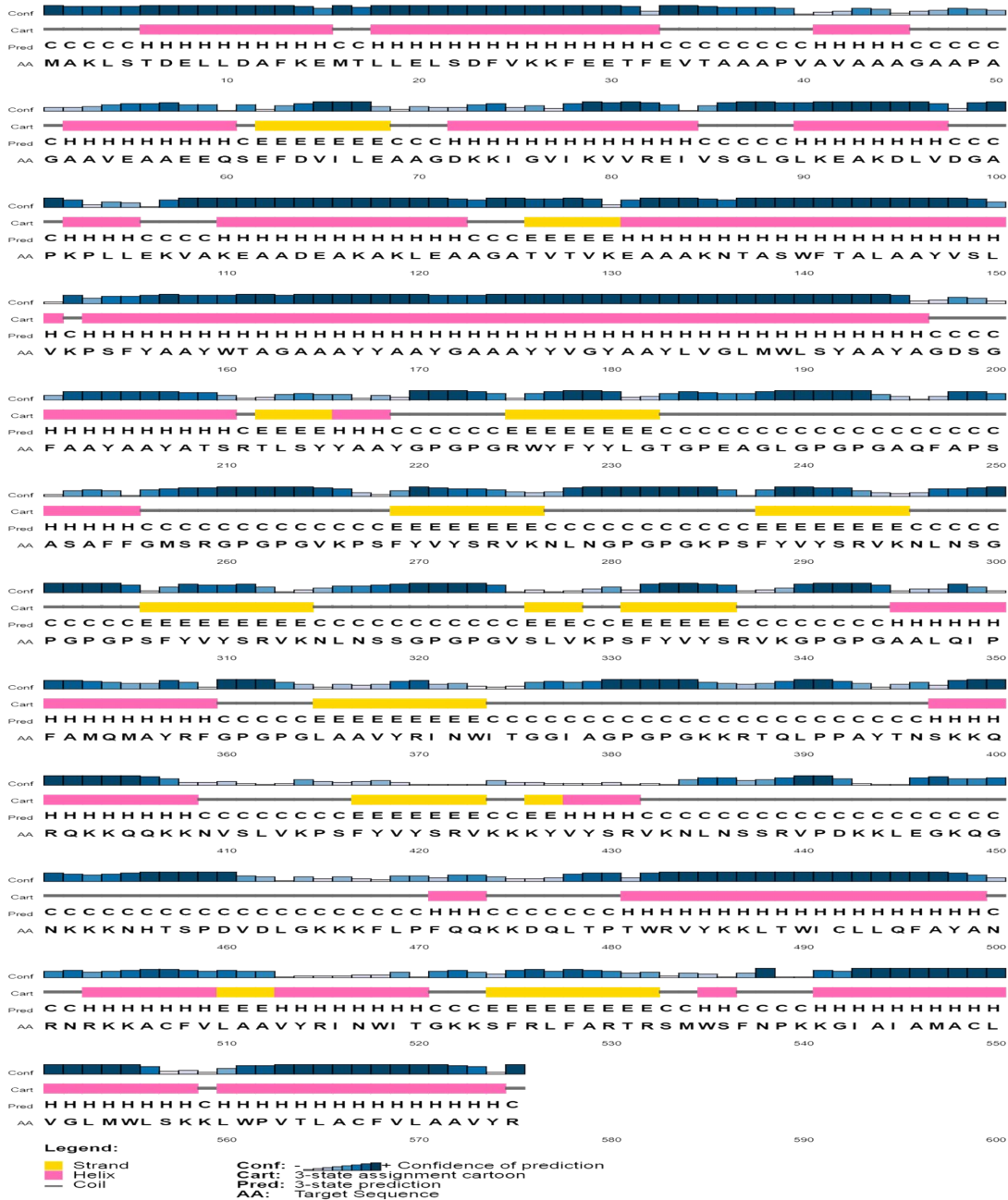
SOPMA :

Alpha helix	(Hh)	:	230	is	40.00%
3 ₁₀ helix	(Gg)	:	0	is	0.00%
Pi helix	(Ii)	:	0	is	0.00%
Beta bridge	(Bb)	:	0	is	0.00%
Extended strand	(Ee)	:	111	is	19.30%
Beta turn	(Tt)	:	0	is	0.00%
Bend region	(Ss)	:	0	is	0.00%
Random coil	(Cc)	:	234	is	40.70%
Ambiguous states (?)	:	:	0	is	0.00%
Other states	:	:	0	is	0.00%

(B)



(C)



(D)

Figure S1: (A) Composition of the secondary structure from amino acid residues of vaccine construct, (B) Predicted secondary structure of vaccine construct by SOPMA server, (C) Predicted secondary structure of vaccine construct by PSIPRED server, and (D) Predicted cart of the vaccine construct by PSIPRED server.