

Delta	NSYECDIPIGAGICASYQTQT	KSHRRARSVASQSIIAYTMSLGAENSVAYSNNNSIAIPTNFTISVTTEILPVSMTKTSVDCTMYICGDS	TECSNLLLQYGSFCTQL	KRAL	764
Omicron JN.1	NSYECDIPIGAGICASYQTQT	KSRRRARSVASQSIIAYTMSLGAENSVAYSNNNSIAIPTNFTISVTTEILPVSMTKTSVDCTMYICGDS	TECSNLLLQYGSFCTQL	KRAL	763
Wuhan	NSYECDIPIGAGICASYQTQTNS	PRRARSVASQSIIAYTMSLGAENSVAYSNNNSIAIPTNFTISVTTEILPVSMTKTSVDCTMYICGDS	TECSNLLLQYGSFCTQL	NRAL	767
Alpha	NSYECDIPIGAGICASYQTQTNS	HRRARSVASQSIIAYTMSLGAENSVAYSNNNSIAIPTNFTISVTTEILPVSMTKTSVDCTMYICGDS	TECSNLLLQYGSFCTQL	NRAL	764
Beta	NSYECDIPIGAGICASYQTQTNS	RRRARSVASQSIIAYTMSLGAENSVAYSNNNSIAIPTNFTISVTTEILPVSMTKTSVDCTMYICGDS	TECSNLLLQYGSFCTQL	NRAL	765
Omicron	NSYECDIPIGAGICASYQTQT	XSXRRARSVASQSIIAYTMSLGAENXVAYSNNNSIAIPTNFTISVTTEILPVSMTKTSVDCTMYICGDS	TECSNLLLQYGSFCTQL	KRAL	767
consensus	!!!!!!!!!!!!!!!!!!!!!!	*!!!!!!!!!!!!!!!!!!!!!!	*!!!!!!!!!!!!!!!!!!!!!!	*!!!!!!!!!!!!!!!!!!!!!!	!!!!



Delta	TGIAVEQDKNTQEVFAQVKQIYKTPPIK	YFGGFNFSQILPDPSKPSKRSFIEDLLFNKVT	LADAGFIKQYGDCLGDIAARDLICAKKF	KGLTVLPPLLTDEMIAQYTSAL	874
Omicron JN.1	TGIAVEQDKNTQEVFAQVKQIYKTPPIK	YFGGFNFSQILPDPSKPSKRSFIEDLLFNKVT	LADAGFIKQYGDCLGDIAARDLICAKKF	NGLTVLPPLLTDEMIAQYTSAL	873
Wuhan	TGIAVEQDKNTQEVFAQVKQIYKTPPIK	DFGGFNFSQILPDPSKPSKRSFIEDLLFNKVT	LADAGFIKQYGDCLGDIAARDLICAKKF	NGLTVLPPLLTDEMIAQYTSAL	877
Alpha	TGIAVEQDKNTQEVFAQVKQIYKTPPIK	DFGGFNFSQILPDPSKPSKRSFIEDLLFNKVT	LADAGFIKQYGDCLGDIAARDLICAKKF	NGLTVLPPLLTDEMIAQYTSAL	874
Beta	TGIAVEQDKNTQEVFAQVKQIYKTPPIK	DFGGFNFSQILPDPSKPSKRSFIEDLLFNKVT	LADAGFIKQYGDCLGDIAARDLICAKKF	NGLTVLPPLLTDEMIAQYTSAL	875
Omicron	TGIAVEQDKNTQEVFAQVKQIYKTPPIK	XFGGFNFSQILPDPSKPSKRSFIEDLLFNKVT	LADAGFIKQYGDCLGDIAARDLICAKKF	NGLTVLPPLLTDEMIAQYTSAL	877
consensus	!!!!!!!!!!!!!!!!!!!!!!	*!!!!!!!!!!!!!!!!!!!!!!	!!!!!!!!!!!!!!!!!!!!!!	*!!!!!!!!!!!!!!!!!!!!!!	!!!!

Delta	LAGTITSGWTFGAGAALQIPFAMQMAYRFNGIGV	TQNVLYENQKLIANQFN	SAIGKIQDSLSS	TASALGKLQDVVN	HNAQALNTLVKQLSS	KFGAISSVLNDI	FSRLDKV	984		
Omicron JN.1	LAGTITSGWTFGAGAALQIPFAMQMAYRFNGIGV	TQNVLYENQKLIANQFN	SAIGKIQDSL	FSTASALGKLQDVVN	HNAQALNTLVKQLSS	KFGAISSVLNDI	LSRLDKV	983		
Wuhan	LAGTITSGWTFGAGAALQIPFAMQMAYRFNGIGV	TQNVLYENQKLIANQFN	SAIGKIQDSL	SS	TASALGKLQDVVN	QNAQALNTLVKQLSS	NFGAISSVLNDI	LSRLDKV	987	
Alpha	LAGTITSGWTFGAGAALQIPFAMQMAYRFNGIGV	TQNVLYENQKLIANQFN	SAIGKIQDSL	SS	TASALGKLQDVVN	QNAQALNTLVKQLSS	NFGAISSVLNDI	LSRLDKV	984	
Beta	LAGTITSGWTFGAGAALQIPFAMQMAYRFNGIGV	TQNVLYENQKLIANQFN	SAIGKIQDSL	SS	TASALGKLQ	NVNVN	QNAQALNTLVKQLSS	NFGAISSVLNDI	LSRLDKV	985
Omicron	LAGTITSGWTFG	XX	XX	XX	XX	XX	SRLDXV	987		
consensus	!!!!!!!!!!!!!!	*****	*****	*****	*****	*****	*****	*****	!!!!*	

Delta	EAEVQIDRLITGRLQSLQTYVTTQQLIRAAEIRAS	ANLAATKMSECVLGQSKRVDFCGKGYHLS	SFPQSAPHGVVFLHVTYVPAQEKNFTT	TAPAICH	DGKAHFPREGVFVS	1094		
Omicron JN.1	EAEVQIDRLITGRLQSLQTYVTTQQLIRAAEIRAS	ANLAATKMSECVLGQSKRVDFCGKGYHLS	SFPQSAPHGVVFLHVTYVPAQEKNFTT	TAPAICH	DGKAHFPREGVFVS	1093		
Wuhan	EAEVQIDRLITGRLQSLQTYVTTQQLIRAAEIRAS	ANLAATKMSECVLGQSKRVDFCGKGYHLS	SFPQSAPHGVVFLHVTYVPAQEKNFTT	TAPAICH	DGKAHFPREGVFVS	1097		
Alpha	EAEVQIDRLITGRLQSLQTYVTTQQLIRAAEIRAS	ANLAATKMSECVLGQSKRVDFCGKGYHLS	SFPQSAPHGVVFLHVTYVPAQEKNFTT	TAPAICH	DGKAHFPREGVFVS	1094		
Beta	EAEVQIDRLITGRLQSLQTYVTTQQLIRAAEIRAS	ANLAATKMSECVLGQSKRVDFCGKGYHLS	SFPQSAPHGVVFLHVTYVPAQEKNFTT	TAPAICH	DGKAHFPREGVFVS	1095		
Omicron	EA	XVXIDRXX	XXLQSLQTYXXXXXXXXXXXX	SANLAATKMSECVLGQSKRVDFCGKGYHLS	SFPQSAPHGVVFLXVTYVPAQEKNFTT	TAPAICH	DGKAHFPREGVFVS	1097
consensus	!!*	*!!*	*!!*	*****	!!!!!!!!!!!!!!	*!!!!!!!!!!!!!!	!!!!!!!!!!!!!!	!!!!

Delta	NGTHWFVTQRNFYEPQIITDNTFVSGNCDVVIGIV	NNTVYDPLQPELDSFKEELDKYFKNHTSPD	VDLGD	ISGINASVVNIQKEIDRLNEVAKNLNES	LIDLQELGKYE	1204	
Omicron JN.1	NGTHWFVTQRNFYEPQIITDNTFVSGNCDVVIGIV	NNTVYDPLQPELDSFKEELDKYFKNHTSPD	VDLGD	ISGINASVVNIQKEIDRLNEVAKNLNES	LIDLQELGKYE	1203	
Wuhan	NGTHWFVTQRNFYEPQIITDNTFVSGNCDVVIGIV	NNTVYDPLQPELDSFKEELDKYFKNHTSPD	VDLGD	ISGINASVVNIQKEIDRLNEVAKNLNES	LIDLQELGKYE	1207	
Alpha	NGTHWFVTQRNFYEPQIITDNTFVSGNCDVVIGIV	NNTVYDPLQPELDSFKEELDKYFKNHTSPD	VDLGD	ISGINASVVNIQKEIDRLNEVAKNLNES	LIDLQELGKYE	1204	
Beta	NGTHWFVTQRNFYEPQIITDNTFVSGNCDVVIGIV	NNTVYDPLQPELDSFKEELDKYFKNHTSPD	VDLGD	ISGINASVVNIQKEIDRLNEVAKNLNES	LIDLQELGKYE	1205	
Omicron	NGTHWFVTQRNFYEPQIITDNTFVSGNCDVVIGIV	NNTVYDPLQPEL	XSFKEELDKYFKNHTSPD	VDLGD	ISGINASVVNIQKEIDRLNEVAKNLNES	LIDLQELGKYE	1207
consensus	!!!!!!!!!!!!!!!!!!!!!!	*!!!!!!!!!!!!!!	*!!!!!!!!!!!!!!	*!!!!!!!!!!!!!!	!!!!!!!!!!!!!!	!!!!	

Delta	QYIKWPWYIWLGFIAGLIAIVMVTIMLCCMTSCC	SLKGCCSCGSCCKFDEDDSEPVLKGVKLHYT	1270
Omicron JN.1	QYIKWPWYIWLGFIAGLIAIVMVTIMLCCMTSCC	SLKGCCSCGSCCKFDEDDSEPVLKGVKLHYT	1269
Wuhan	QYIKWPWYIWLGFIAGLIAIVMVTIMLCCMTSCC	SLKGCCSCGSCCKFDEDDSEPVLKGVKLHYT	1273
Alpha	QYIKWPWYIWLGFIAGLIAIVMVTIMLCCMTSCC	SLKGCCSCGSCCKFDEDDSEPVLKGVKLHYT	1270
Beta	QYIKWPWYIWLGFIAGLIAIVMVTIMLCCMTSCC	SLKGCCSCGSCCKFDEDDSEPVLKGVKLHYT	1271
Omicron	QYIKWPWYIWLGFIAGLIAIVMVTIMLCCMTSCC	SLKGCCSCGSCCKFDEDDSEPVLKGVKLHYT	1273
consensus	!!!!!!!!!!!!!!!!!!!!!!	!!!!!!!!!!!!!!!!!!!!!!	!!!!

 non-conserved
 $\geq 50\%$ conserved