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**Supplemental information**

**Lack of memory recall in human**

**CD4 T cells elicited by the first**

**encounter with SARS-CoV-2**

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SARS-CoV-2 Protein	Number of amino acids	Number of Peptides (17-mers, 11aa overlap)	Protein Sequence	Accession Number
ORF1ab1 NSP1 Leader Protein	180	36	MESLVPGFNEKTHVQLSLVPLVLRVDFVIRGFGDSVEEVLSEARQHKDGTGCLVEKGVLPQLQEPYVFIKRSRDARTAPHGHVMMVFLVA ELEGIQYGRSGRTEGLVLPVHVEIPVAYRKLRRKNGKAGGHSYGADLSFDLDELGTDPYEDFQENWNTKHSQVTRMLRELINGG	YP_009725297.1
ORF1ab1 NSP2	638	130	AYTRVVDNDFCGDPGVEPLKIDLLARAGKASCTSEQLDFDITKRGVYCCREHEJIAWYTERSEKVELQTPFEIKLAKKFDTPNGECNPFV FPLNSIIKTIQPRVEKKLDGFMGRIRSYVPVSPNECNQMLCLSTMKCDHCGETSQWQDFVKAATCEFCGNTLENKAGTTCGYLPQNAV VKYCPACHNSEVGPESHLEAYHNESGLTKLRKGGRTIAFGGCVFVSGCHNKAAYVPRASANIQCNTGVGESEGDNDLLEILQKE KVNINIVGDFKNEEIIAIFLASFASSTAFVETKGLDYKAFKQIVESCGNFVTKGKAKKAGAWNIQEKQSLPLVAFASEAARVRSIFSR LETAQNSVRVLQAAITLDIGISQYLRUADMMFTSDLATNNLVMAYITGGVQLTSQWLTNIFGTYEKLKPLVDWLEEFKKEGVFLP RDGWEIFVSTIACEIVGGQVITCAKEIKESVQTFKLVNFKLALCADSIHGGAKKALNGETFVTHSKGLRKCVRSEETGLMLPKAKP EIFFLEGETLPEVLEVEVLLKGLDQLPEQPTSEAVEAPLVGTPVQINGLMLEIKDTEKYCALANMMVTNNTFTSKGG	YP_009725298.1
ORF1ab1 NSP3 Papain like Proteinase	1945	387	APTkvTfGGDDTIEVQGYKSVNITFELDERIDKVLNCKSAYTVELGTEVNEFACVAVADAVIKLQPVSELTPLGIDDEWSMATYYLFDSE GFKLASHMYSVFPDFDEEGDCEEEFEPSTQYEYGETDDYQKPLEFGATSAALQPEEQEEDWLDLDDSQVGGQDGSSENOQT TTIQITIVVQPELEMLTPVQVIEVNSFSGYLKTDNVIYKADIVAEAKVKTPTVVNAANVYLVKGGGAGALNKANAMQVESD DYIATNGPLKVGSCVLSGHNLAHKLHVVGPNVNGEDIQLLKSAYENFQHEVLLAPLSAGIFGADPHILSRVCDVTFRVNLVAVFDFK NLYDKLVSSFEMKSEKQVEQKIAEIPKEEVKPFITESPVEQRKDDKIKACVEEVTTLETFTLENLLYIDINGNLPDASTLVSDIDI TFLDKDAPYIVGVDVQEVGLTAVIPTKAGGTTEMLAKALRKVPDNYITTPGQGLNGYVEEAKTVLKKCSAFYLSIISNEKIEGT VSNWLNRELAHAEETRKLMPVCVETKAVISTIQRKYKIKIQEVDYGARFYFTSKTIVASUNTLNDLNETLVMPLGVYTHGLNLEEA ARYMRSKVPATVSPDVAIYNGLTSSKTPPEHFITISLAGSYKDWYSQSGTQLGIEFLKRGDYSYVNSPTFTHDLQGVITFDON LKTLSLREVRTIKVFTVDNIHLTQVDMSTMVYGGQFPTYLGDADVTKIKPHNSHEGKTFYVLPNDTDRVEAFYYHTDPDLSGRY MSALNHTKKWYIPQVNGLTSIKWADNNCLATALLTQQLKELFNPALQDAVYRARAGEAANFALILAYCNKTVAGELGDVRETMYSYLF QHANLDSKRVLNVCCTCGGQQLTKGVEAYMVMYMTLSYEQFKKGVQVICTCGKQATKYLVLQQESPFVMMSSAPWALHGLKFTTC ASEYTGNYQCGHYKHTSKETLYIDGALLTKSSEYKPIITFVFKENSYTITTPVTKYLDGVVCTEIDPKLDNYKDNSTVTEQIPDLVQNP PYPNASDFNFKVCNDFKADDLNLQTLGKYKPARLEKVTFFDPLDNGDVVAIDYKHVPSFKKAGLHKHPVWVHMMLNTPAKTYKNTWC IRCLWSTKPVETSNSFVLSKEDAGQMDLACEDLKPVEEVENPTIQKQVLECNKVTTEVGDIIKPPANSLKITEVGGHTMLDAAAY DNSLTIKPKNRSVLRLGLKTLATHGLAAVNSVPWDIANYAKPFLNKVSTTTNIVTRCLNRCVCTNYMPTFFYLLQLKCTFTFRSRIKAS MPTTIAKNTKSVKGFCEASFNYLKSPLNFSLKLIWVLLSCLGSYVSTAALGLVMSNLGMSYCTGYREGLNSTNVTIATYCTGSPIC SVCLSLDLSLTDYPSLETIQITISFKWDLTAFGLVAEWFILYTRFFVYGLAIAMQLFFSFAVHFISNSWMLUWLIQVQAPISAM VVMYIFASFYVWKSIVHVDGNSSTCMCYKRNRRVRECTTIVNGVRRSFYVYANGGKGFCKLHWNVCVCDTFCAGSTFISDE VARDLSLQKRPINPTDQSSYIVDSVTYKNGSIHLVYDKAGQTYRHSLSHFVNDLNRANTKGLPINVIVFDGSKCESSAKSASVYV SQLMCPILLDQALVDVSDSAEAVKMFDAVYNTSFTFVPMKELTLVATAEALAKNSLDNLSTFISAARAGVDSVDKED VVECLKSHQSDIIEVTGDSNNMLYTNKVENMTPRDLGACDCAARHINAQVAKSHIALIWNKDFMSLSEQLRQIRSAAKNLPFK LTCATTRQVNVVTTKJALKGG	YP_009725299.1
ORF1ab1 NSP4	500	98	KIVNNWKLQIKVTLVFLVAAYFYLTIPVHVMKSHDTFSEIIGYKAIIDGGVTRDIASDTCTCFANKHADFTWFQSRGGSYVNDKACPLIA AVITREVGFPVPLGPTILRTNGDFLHLPVRSFSAVGNICTYPSKLEIYDIATISACVLAEECTIFKDAKGPVYCYDTNVLGSAVESLRP DTRYVLMDDGSIQFNPNTLEGSVRYVTTDFSEYCRHGTCERSEAGVCVSTSRWVLLNDYRSVLPVGFVADVNLNMTFTPLQIPGAL DISASIVAGGIVAVITCLAYFMFRRAFGSHYSHVAFNTLFLMSFTVLTCLPVYSLPQVSYVYLTYLTVLNDVSLAHQWVMVMTF PLVPFWITAIYICISKHFYWFSSYLKRRVFNVSFSTFEAAALCTFLNEMKYLKRSDLPLTQYRNYLYNKYKYSFGAMQDTSYR EAAACHLAKALNDFSNSGSDVLYQPPQTSITSAVLQ	YP_009725300.1
ORF1ab1 NSP5 3C-like proteinase	306	61	GFRKMAFSPGKVEGCMVQVTCGTTTLNGLWDDVYVPRHVICSTEDMLNPNYEDLLIRKSNHFLVQAGNVLRVGHISMQNCLVLLK VDTANPKTPKRYFRVRIQPGQTFVSLACVNGSPSGVYQCAMRPNFTIKGSLNGSCVGFNIDYDCVFCYMHMLNTPGTGVTAGDPLEG NFYGFVDRQTAQAAGDGTITITVNLWLAAYAVINDGRWFLNRRFTLLDNFLVAMKYNEPLTQDHDVILGLPSAQITGAVLDMCASL KELLQNGMNRGTLQSGALLEDEFPTFDVYRQCSGVTFQ	YP_009725301.1
ORF1ab1 NSP6	290	55	SAVKRTIKGTHHWLLTLLSLLVQSTQWLSFFLYENAFLPFAMGIIAMSAFAMVFKHFKHAFCLFLPLSLIATVAFYNNVYMPAS WVMRIMTVDMDVDTSLGFKLDCVMYASAVLMLTARTVYDGGARRVWLMNVLTVYKYNALQDQAIMSWALISYSNYS GVVTVVMFLARGIVMVEYECFFITGNTLQQLMLVYCFGLVCTCYGLFLCLLNRVFRLLTGVYDVLSTQEFYRIMSQGLPKNNSIDAF KLNIKLLGCVGGKPCIKVATVQ	YP_009725302.1
ORF1ab1 NSP7	83	16	SKMSDVCTSVLVSLSLQLRHESSSLKVAQCVQLHNDILLAKDTTEAFKEMVSLSVLSMQGAVDINKCEEMLDNRATQ	YP_009725303.1
ORF1ab1 NSP8	198	39	AIASEFSLPSYAFATAQEAQEVANGDSEVLLKLSLNVAKSEFRDAAMQRKLEKMAADQAMTQMYKQARSEDKRAKVTSAM QTMFLTLRKLNDALNINIANNARDGCVPLNIPLTAAKLMVVPIDNYTKNCTDGTFTYASALWEIQVVDADSKVILQSEISMDNSP NLAWPLVITLALRANSVAVKLQ	YP_009725304.1
ORF1ab1 NSP9	113	21	NNELPVALRQMSCAAAGTTQACTDNDALYANNYTKGRFVRLALLSDQLKWARFPKSDGTGTIYTELEPPCRVTDTPKPKGVYLYFIK GLNLRNMGVLSGLAATVRLQ	YP_009725305.1
ORF1ab1 NSP10	139	27	AGNATEVPANSTVLSFCFAFYDAAKAYDYLAGGGPITNCVKMLCTHTGTQAIITVPEANNMQDESFGGASCCLYCRCHDHPNPKGF CDLKGKVVQIPTTCANDPVGFTLKVCTVCGMVKWGGVCSQDLRQEMLQ	YP_009725306.1
ORF1ab1 NSP12 RNA Dependent RNA Polymerase	932	185	SADAQSFNLRVCGVASARLTGCTGTDVYVYRAFDIYNDKVGAFKLTNCCRFQEKEDDNDLDSYFVVKRHTFSNYQHEETIYLLKD CPAVAKHDFRFRIDGDMVPHISRQLTKYTMADLVYALRHFDGECNDLKEIIVLTYNCCDDYFNKDWYDFVENPDLRVAINGERV QALKTVCFQDAMRNAGIVGLVLTLDNQDLNGNMYDFDGIQITPGSGVPPVDSYSLMLPILTRALTAESHVDTLTKYKDWDLKY DFTTEERLDRYFWDQTYVHNCVCLDRCLHCAFVLFSTVFPPTSFGPLVKRIFVDGVPFVSTGYHFHGLHKNYDQWVHSHSR LSFKELLYAADPAMHAASGNLLDRTCFSAALTNVAVFQTKPKNFQDFYAVSKGFFKEGSSVELKHFAFQDQNAALSYDDY YRYNLPTMCIARQLLFLVVDYKDFCYDGGCINANQVNNLDSAGFPNKGWKAIRYDMSYEDQDLDAFTYRPNITITMNLK YIASAKNRARTVAGVSICTMTRQFHQKLKLSIAARTGATVIGTSKFGWVHMLKTVSDVENPHMLGWDPKCDRAMPNMLR MASLVLARKHTCCLSHRFYRLANECAQLSEMVMCGGSLYVKGPGTSSGDATTAYNSVFNCOAVTANWALLSDGNKIAKDYVR NLQHLRYECLYRNRDVTDFVNEFYALRKHFSMMLSDDAVCFNSYASQGLVASIKNFSLVYQNNVFMSEAKWETDLTKGPH FCSQHTMLVKGDDVYVLPDPDRILGAGCFVDDIVKTDGTLMIERFVLSAIDAPLTKHPNQYADVFHLVLYQRKLDHDLTGMHLD YSVMLTNDNTSRVWEPFYEAMTYPTHVQLQ	YP_009725307.1
ORF1ab1 NSP13 Helicase	601	119	AVGACVLCNSQTSLRGACIRRFPCCKCYDHSVISHKLVLSVNPVCPNAGCDVTDVTLVGLGMSYCKSHKPPISFLCANGQVFLG YKNTCVGSDNVTFDFAIATCDWNTAGDYLANTCTERLKLFAETLKAETEFLKSLYGIATVREVLSDRHELHWEVGRKPPRLNRYVFTGY RVTKNSKQVIGEYTFEKDYGDAVYVRYGTTKLVNVDYVLTSHVMLPSAPLTPQEHYVRITGLYPLNSDEFSNNVANYQVGMQ KYSTLQGGPPTGKSHFAGLALYPSARIYVITACSHAAYDVALCEKALKYLPDKSRIIPARARVECFDKFVNSTLQEVFVCTNALPDTADI VVFDEISMATNYDLVSVNARLAKHCVGIDYPAQLPAPRTLLKGTLEPEYFNSVCLRMKTIQPDMLGTCCRCRPAIVDTVSAALVYDNLK AHKDKSAQCVMFYKGIYHDSVAIIRPQIGVREFLTRNPAWRKAVFISPNVQNAVASKILGPTQTVDSSQSEYDYVIFTQTETETA HSCNVNRFVAITRAKVLGILCIMSDDRLDQLFTSLEIPRRNVATLQ	YP_009725308.1
ORF1ab1 NSP14 3' to 5' Endonuclease, N7-Methyltransferase	527	103	AENVTLGDKCSDKVIQHTGHTQAPHLSDVTKFKTEGLCVDIPGIPKDMTYRRLSMMGMFKNYQVNGYPMFITREAIHRVRAWIGFD VEGCHATREAVGTNLRLQLGFTGNLVAVPTGVYDTPNNTDSRYSAKPPPGDQFKLHPLMKYGLPWNVRIKIVQMSLDTLKNLSDR VVFVLWAHGFELTSMKYVNIKGPRTCCLDRTAFCSTASDYACWHHSIGFDYVYVPFMIDVQWGFTGNLQSNHLYCQVHGNAG VASCDIIMTRCLAHECFVVRVDWITIEYPIIGDEKINAAACRQVQHMVKAALLADKFPVLDHIGNKPAIKCVPQAQVDEWKFYDAQPCSD KAYKIEELFYSATHSDKFTDGLVFLWNCVNDRYPANSIVCRFDRVLSNLNPLGCDGGSLVYVNHKHFAPFDKSAFVNLQPLFFPYSDS PCESHKQVSDIVYPLKSACTICRLNCGAVCRHHAENEYRLDANMMSIAGFSLWYKQFDTYNLWNFTRLQ	YP_009725309.1
ORF1ab1 NSP15 endoRNase	346	67	SLENVAFNVWNGHFDGGQGEVPPSIINNVTYTKV DGVDELFEKNKTLPVNVAFELWAKRNKVPVVKILNGLVDIAANTVYIWDYKR DAPAHISTIGVCSMTDIANKPTETICAPTVFFDGRVDGQDLFRNARNGLVTEGVSVKGLQPSVGPQASLNGVTVLGEAVKTFQPFYKMR DGVVVQLPETYFTQSRNLQEFKPRSQMIEIDFLEAMDEFIERLEGYAFEHIVYDGFSHSQGLLGLIKARFKFESPELAFNNDST VKNYFIDAQTGSSKVCVSIIDLLDFFVHISQDLSVSVKVVITDIYTESFMLWCKDGHVETFPKPLQ	YP_009725310.1
ORF1ab1 NSP16 2'-O-Ribose-Methyltransferase	298	58	SSQAWQGVAMPNLYKMQRMLEKCDLQNGDSATPKGIMMNVAKYTLQCLQYLTLVAPYNNRIRHFAGGSDKGVAPGTAVLR QWPLPTGLLVDSDLNDFSDASDITGDCAVHTANKWDUIISDMYDPTKNTKENDSEKFFTYICGFIQQLALGSGVAIKITESHVWN ADLYKLMGHFAWTAFTVNTMNASSEAFILGNYLGRQREQIDGVYMHANFYWRNTNPIQLSSYSLFDMKPKPLRGTAVMSLKEGQ INDMILSLSKGRILIRENNRVISSDVLVNN	YP_009725311.1

SARS-CoV-2 Protein	Number of amino acids	Number of Peptides (17-mers, 11aa overlap)	Protein Sequence	Accession Number
ORF3a	275	54	MDLFRIRIFTGTIVTLKQEKIDATPSDFVRATATIPIQASLPFGWLVVGVALLAVFQSASKIITLKKRWQLALSKGVHFVNCNLLLFVTYSH LLLYAAGLEAPFLYLALVYFQSIINFVRIIMRLWLWCKRKNPLLYDANFYLCWHTNCDYDIPYNSVTSIWIYTSDDGTTSPISEHDYQIG GYTEKWESGVKDCVLLHSYFTSDYYQLYSTQLSDTDTGVEHVTFYINKIIVDEPEEHVQIHTIDGSSGVVNPVMEPIYDEPTTTTSVPL	QHD43417.1
ORF6	61	11	MFHLVDFQVTAIEILLIIMRTFKVSIWNLDYIINLIKNLSKSLTENKYSQLEEQPMIED	QHD43420.1
ORF7a	121	24	MKILFLALITLATCELYHYQECVRRGTTVLLKEPCSSGTYESPFHPLADNKFALTCFSTQFAFACPDGVKHHVQRLRARSVSKPLIRQEEVQ ELYSPIFLVAAIVFILTCLTKRKE	QHD43421.1
ORF8	121	22	MKFLVFLGIITVAAFHQECSLQSDCTQHQPVVVDDPCPIHFYSKWYIRVGRARKSAPLIELCVDEAGSKSPIQYIDIGNYTVSLCPTINCCQEP KLGSLVVRCSFYEDFLYHVDVRLDFI	QHD43422.1
ORF10	38	9	MGYINVFAPFTIYSLLCRMNSRNVIQVDDVNFNL	QHI42199.1
Spike (S, ORF2)	1273	253	MFVFLVLLPSSQCVNLTTRTQLPPAYTNSFTRGVVYDPKVFSSVHSTQDLPLPFSNVTWFHAIHVSNGTNGKRFNPLPFDNGVY FASTEKSNIRGWIFGTTLDKSTQSLVNNATNVIVKCEFOFNDPFLGVYYHKNKNSWMESEFRVYSSANNCFTFEYVSQPFMLDLEK QGNFKNLRFEVFNIDGFKIYKHTPINLVRDLQPGFSALEPLVDPIGINITRFQTLALHRSYLTGDS55GWTAGAAAYVGYLQRTFL LKYNENGTITDAVDCALDPLSETKCTLSFTVEKGIYQTSNFRVQPTESIVRFNITNLCPEGFENATRFASVVAWNRKRISNCVADYSVLY NSASFSTFKCYGVSPKLNLDLCTNVAADFVIRGDEVRIQAPGQTKIADYNYKLPDFTGCVIAWNSNLDKSKVGGNYNYLRLFRKSNL KPFERDITEIYQAGSTPCNGVEGFNCFYPLQSYGFPQPTNGVGYQPYRVVLSFELLHAPATVCGPKKSTNLVKNKCVNFNGLTGTGVL ESNKKFLPFQGRDIADTTDAVRDPTLEIDLITPCSGFVGVSVITPGTNSNQAVLYQDNCVTEVPVAIHADQLTPTWRVYSTGNSVF QTRAGCLIGAHEVNNSEYCDPIGAGICASYQTQNSPRRARSVASQSIIAVTMSLGAENSVAYSNSIAIPTNFISVTEILPVSMTKTSV DCTMYICGDSSTECNLLQLQYSGFCTQLNRALTGIAVEQDKNTQEVFAQKQIYKTPPIKDFGFFNSQJLPDPSKPSKRSFIEDLLNKVTLA DAGFIKYGDCLDGIIAARDLCAQFNGLTLPPLLDDEMIQYTSALLAGTISGWTFGAGAAIQPFAMQAMAYRFNGIGVTVQNVLYEN QKLIANQNSAIGKIQDSLSSTASALGKLDVNVQNAQALNTLVKQLSSNFGAISSVLDLISRLDKVEAEVQIDRLITGRLOSQTYYTQQ LIRAAEIRASANAATKMSCEVLGQSKRVDFCGKGYHLMSPQASPHGVVFLHVTYVPAQEKNFITAPAIHGDGKAHPREGVYFVMSNGTH VWVTKRNFYEPQIITDNTFVSGNCDVIGIVNNTVYDLPQELDSFKEELDKYFKNHTSPDVLGDISGINASVNIQKEIDRLNEVAKNL NESLIDLQELGKYEYKWPWYIWLGFIAGLIAIVMTIMLCM2SCCSCLGKCCSCGSCCKFDEDDSEPVKGLKVIHYT	QHD43416.1
Envelope (E, ORF4)	75	13	MYSFVSEETGTLVNSVLLFLAFVFLVTLAILTALRLCAYCCNIVNVLKPSFYVYSRVKLNLSRVPDLLV	QHD43418.1
Membrane (M, ORF5)	222	42	MADSNGTITVEELKLEQWNLVIGFLFTWICLLQFAYANRRNRYIIKLIFLWLLWPVTLACFVLAAYRINWITGGIAIAMACLGLMW LSYFIASFRLFARTSMWFSNPETNILLNVPLHGTILRPLESELVIGAVILRHLRIAGHLGRCDIKDLPEKITVATSRITLKYLGASQKRV GDSGFAAYSRIRYGNKLNTHSSSDNIALLVQ	QHD43419.1
Nucleocapsid (N, ORF9)	419	82	MSDNGPQNQRNAPRITGGPSDSTGSNNGERSGARSQRRPQGLPNNTASWFTALTQHGKEDLKFPRGQGVPIINTNSPDDQIGYYR RATRIRGGDGKMKDLSPRWYFYLLGTGPEAGLPYGANKDGIWVATEGALNTPKDHIGTRNPANNAIIVLQLPQGTTLKPGFYAEGSRGG SQASSRSSRSRNSLRNSTPGSSRGTSPARMAAGNGDAAALLLDRNLQLESKMSKGGQQQGTQVTKSAAEASKPKRQRTATKAY NVTQAFGRRGPEQTQGNFGDQELRQGTQDYKHWPQIAQFAPSAAFFGMSRIGMEVTPSGTWTLYTGAIKLDKDPNFKDQVILLNKHI DAYKTFPPTEPKKKKKKADETQALPQRKKQQTVTLPLAADLDFSKLQSQSMSSADSTQA	QHD43423.2

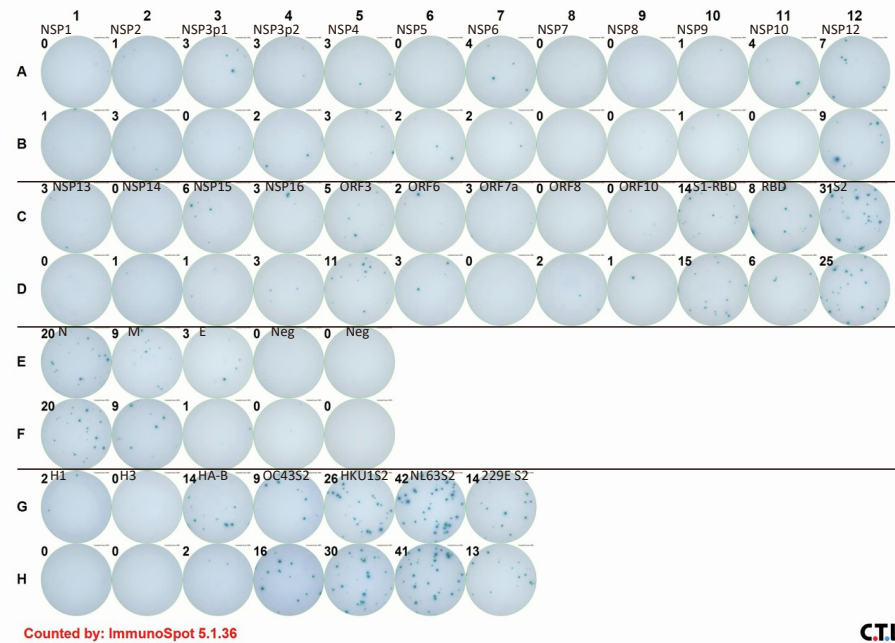
Supplemental Table 1. SARS-CoV-2 protein sequences used to create the peptide pools, with indicating regarding nomenclature, size, and accession numbers <sup>1,2</sup>.

## References

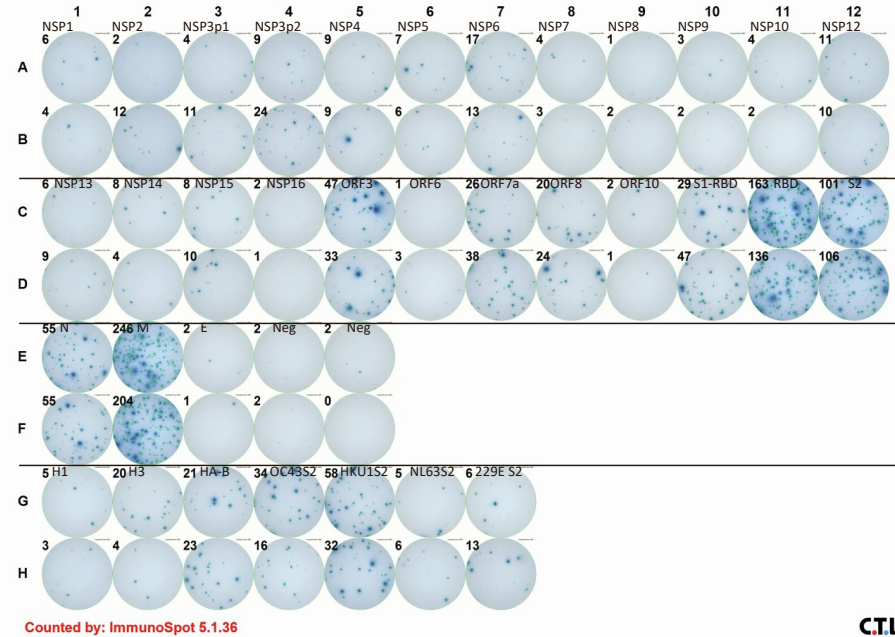
1. Wu, F., Zhao, S., Yu, B., Chen, Y.M., Wang, W., Song, Z.G., Hu, Y., Tao, Z.W., Tian, J.H., Pei, Y.Y., et al. (2020). A new coronavirus associated with human respiratory disease in China. *Nature* 579, 265-269. 10.1038/s41586-020-2008-3.
2. Yoshimoto, F.K. (2020). The Proteins of Severe Acute Respiratory Syndrome Coronavirus-2 (SARS CoV-2 or n-COV19), the Cause of COVID-19. *Protein J* 39, 198-216. 10.1007/s10930-020-09901-4.

Unique			Conserved		
Peptide Number	Amino Acids	Sequence	Peptide Number	Amino Acids	Sequence
p1	1-17	MFVFLVLLPLVSSQCVN	p54	266-282	YVGYLQPRTFLLKYNEN
p2	6-22	VLLPLVSSQCVNLTTRT	p55	271-287	QPRTFLLKYNENGTITD
p3	11-27	VSSQCVNLTTRTQLPPA	p56	276-292	LLKYNENGTITDAVDCA
p4	16-32	VNLTTRTQLPPAYTNSF	p57	281-297	ENGTITDAVDCALDPLS
p5	21-37	RTQLPPAYTNSFTRGVY	p58	286-302	TDAVDCALDPLSETKCT
p7	31-47	SFTRGVYYPDKVFRSSV	p59	291-307	CALDPLSETKCTLKSF
p8	36-52	VYYPDKVFRSSVLHSTQ	p70	346-362	RFASVYAWNRKRISNCV
p13	61-77	NVTWFHAIHVSNGTNGTK	p71	351-367	YAWNRKRISNCVADYSV
p14	66-82	HAIHVSNGTNGTKRFDNF	p72	356-372	KRISNCVADYSVLYNSA
p16	76-92	TKRFDNFVLPFNDGVYF	p143	711-727	STAIPTNFTISVTTTEIL
p20	96-112	EKSNIIRGWIFGTTLDS	p150	746-762	STECSNLLQYGSFCTQ
p29	141-157	LGVYHKNNKSWMESEF	p151	751-767	NLLQYGSFCTQLNRAL
p30	146-162	HKNKSWMESEFRVYSS	p152	756-772	YGSFCTQLNRALTGI
p31	151-167	SWMESEFRVYSSANNCT	p162	806-822	LPDPSKPSKRSFIEDLL
p32	156-162	EFRVYSSANNCTFEYVS	p163	811-827	KPSKRSFIEDLLFNKVT
p33	161-177	SSANNCTFEYVSQPFLLM	p164	816-832	SFIEDLLFNKVTLADAG
p34	166-182	CTFEYVSQPFLLMDLEGK	p165	821-837	LLFNKVTLADAGFIKQY
p35	171-187	VSQPFLLMDLEGKGNFK	p166	826-842	VTLADAGFIKQYGDCLG
p42	206-222	KHTPINLVRDLPLQGFSA	p169	841-857	LGDI AARDL ICAQKFN
p43	211-227	NLVRDLPLQGFSALEPLV	p170	846-862	ARDL ICAQKFNGLTVLP
p44	216-232	LPQGFSALEPLVDLPIG	p171	851-867	CAQKFNGLTVLPPLTD
p45	221-237	SALEPLVDLPIGINITR	p172	856-872	NGLTVLPPLTDEMIAQ
p46	226-242	LVDLPIGINITRFQTL	p180	896-912	IPFAMQMAYRFNGIGVT
p47	231-247	IGINITRFQTLALHRS	p181	901-917	QMAYRFNGIGVTQNVLY
p49	241-257	LLALHRSYLTGDSSSG	p182	906-922	FNGIGVTQNVLYENQKL
p73	361-377	CVADYSVLYNSASFSTF	p183	911-927	VTQNVLYENQKLIANQF
p75	371-387	SASFSTFKCYGVSPTKL	p184	916-932	LYENQKLIANQFN SAIG
p81	401-417	VIRGDEV RQIAPGQTGK	p185	921-937	KLIANQFN SAIGKI QDS
p87	431-447	GCVI AWNSNLD SKVGG	p188	936-952	DSLSTASALGKLDQDVV
p88	436-452	WNSNLD SKVGGNYNYL	p189	941-957	TASALGKLDQDVVNQNAQ
p92	456-472	FRKSNLKPFFERDISTEI	p190	946-962	GKLDQDVVNQNAQNTL
p93	461-477	LKPFERDISTEIYQAGS	p191	951-967	VVNQNAQALNTLVKQLS
p94	466-482	RDISTEIYQAGSTPCNG	p192	956-972	AQALNTLVKQLSSNF GA
p95	471-487	EIYQAGSTPCNGVEGFN	p193	961-977	TLVKQLSSNF GAIS SVL
p102	506-522	QPYRVVLSFELLHAPA	p194	966-982	LSSNF GAIS SVLNDILS
p103	511-527	VVLSFELLHAPATVCGP	p195	971-987	GAIS SVLNDILSRLDKV
p104	516-532	ELLHAPATVCGPKKSTN	p196	976-992	VLNDILSRLDKVEAEVQ
p105	521-537	PATVCGPKKSTNLVKNK	p197	981-997	LSRLDKVEAEVQIDRLI
p113	561-577	PFQQGRDIADTTDAVR	p198	986-1002	KVEAEVQIDRLITGRLQ
p120	596-612	SVITPGTNTSNQVAVLY	p199	991-1007	VQIDRLITGRLQSLQTY
p123	611-627	LYQDVNCTEVFVAIHAD	p200	996-1012	LITGRLQSLQTYVTQQL
p127	631-647	PTWRVYSTGSNVQTRA	p201	1001-1017	LQSLQTYVTQQLIRAAE
p136	676-692	TQTNSPRRARSVASQSI	p205	1021-1037	SANLAATKMSCEVLGQS
p138	686-702	SVASQSI IAYTMSLGAE	p206	1026-1042	ATKMSCEVLGQSKRVDF
p139	691-707	SIIAYTMSLGAENSVAY	p207	1031-1047	ECVLGQSKRVDFCGKGY
p146	726-742	ILPVSMTKTSVDC TMYI	p208	1036-1052	QSKRVDFCGKGYHLM SF
p147	731-747	MTKTSVDC TMYICGDST	p209	1041-1057	DFCGKGYHLM SF PQSAP
p154	766-782	ALTGIAVEQDKNTQEVF	p210	1046-1062	GYHLM SF PQSAPHG VVF
p155	771-787	AVEQDKNTQEVFAQVKQ	p211	1051-1067	SFPQSAPHG VVFLHV TY
p156	776-792	KNTQEVFAQVKQIYKTP	p212	1056-1072	APHGVVFLHV TYVPAQE
p157	781-797	VFAQVKQIYKTPPIKDF	p228	1136-1152	TVYDPLQPELDSFKEEL
p158	786-802	KQIYKTPPIKDFGGFNF	p229	1141-1157	LQPELDSFKEELDKYFK
p159	791-807	TPPIKDFGGFNFSQILP	p230	1146-1162	DSFKEELDKYFKNHTSP
p160	796-812	DFGGFNFSQILPDP SKP	p231	1151-1167	ELDKYFKNHTSPD VDLG
p161	801-817	NFSQILPDP SKPSKRSF	p232	1156-1172	FKNHTSPD VDLGDISGI
p179	891-907	GAALQIPFAMQMAYRFN	p237	1181-1197	KEIDRLNEVAKNLNESL
p215	1071-1087	QEKNF T TAPAICH DGKA	p238	1186-1202	LNEVAKNLNESLIDLQE
p226	1126-1142	CDVVIGIVNNTVYDPLQ	p239	1191-1207	KNLNESLIDLQELGKYE
p227	1131-1147	GIVNNTVYDPLQPELDS	p240	1196-1212	SLIDLQELGKYEQYIKW
p244	1216-1232	IWLGFIAGLIAIVMVTI	p241	1201-1217	QELGKYEQYIKWPWYIW
p245	1221-1237	IAGLIAIVMVTIMLCCM	p242	1206-1222	YEQYIKWPWYIWLGFIA

Supplemental Table 2. SARS-CoV-2 Spike peptides included in the unique and conserved peptide pools used in Figure 8 and Supplemental Figure 3.

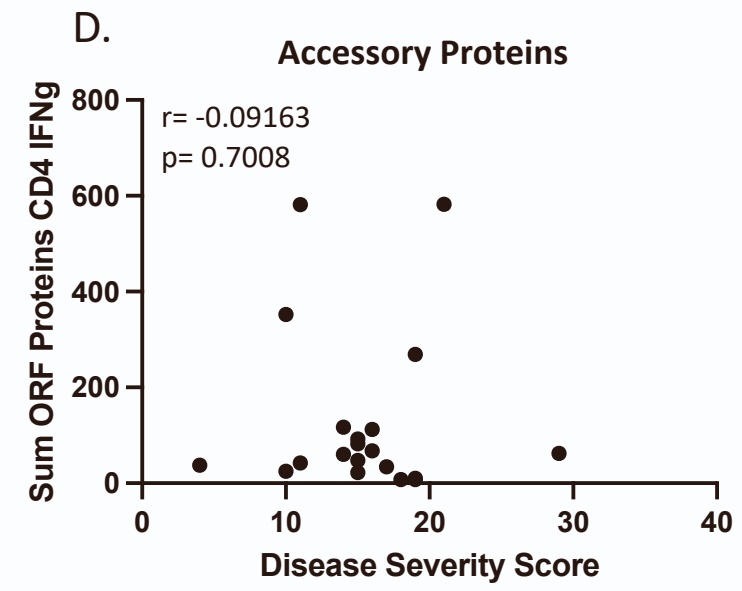
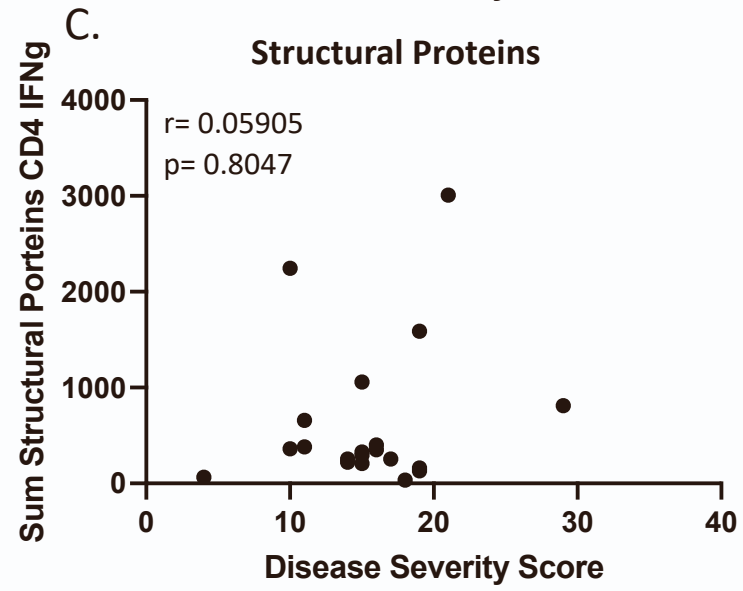
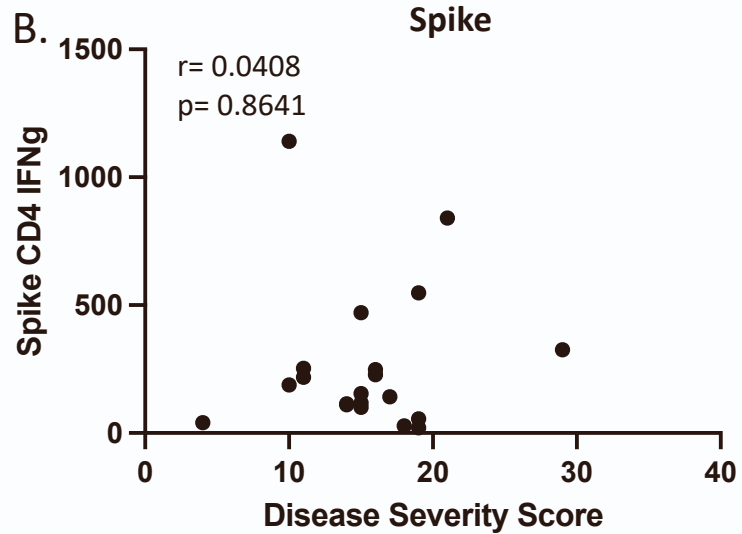
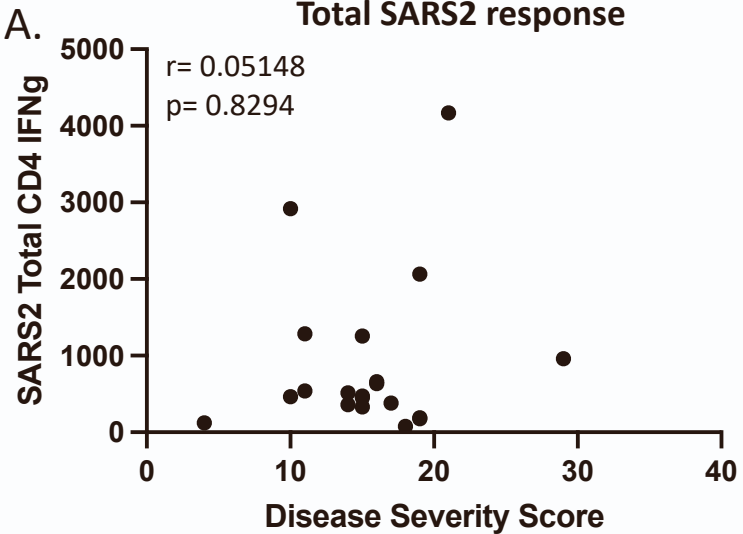


CTL

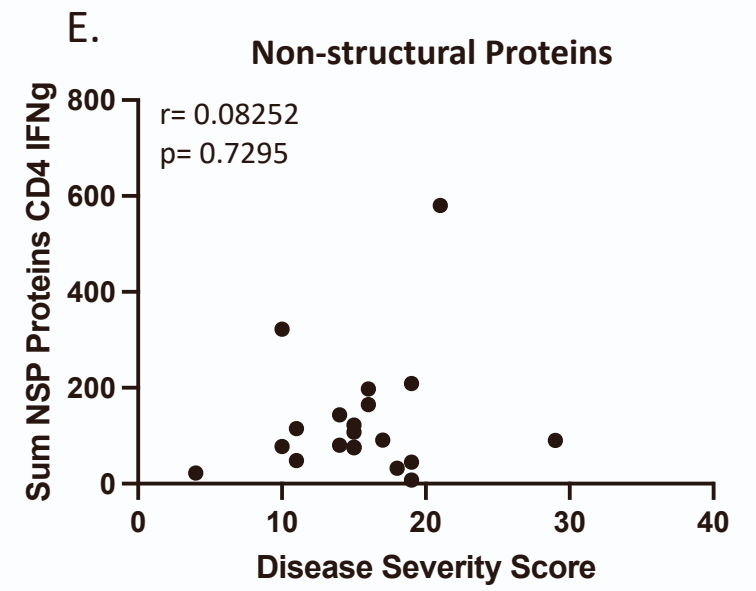


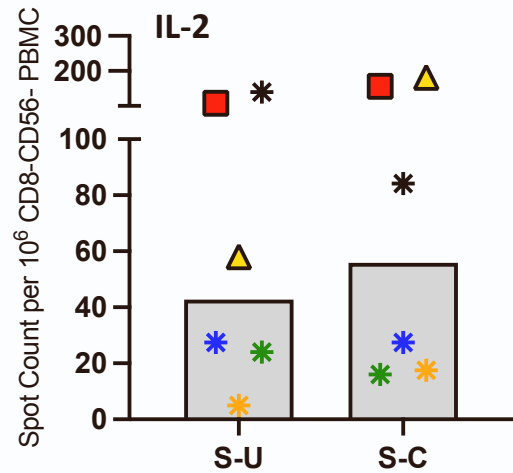
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Supplemental Figure 1. Representative ELISPOT plate images from two SARS-CoV-2 subjects. The stimulation condition (peptide pool) is indicated above the duplicate wells, which are vertical. The spot count for each well is shown in the upper left corner of the well.



Supplemental Figure 2. Severity of infection is not a correlate of the CD4 T cells response. The disease severity score, calculated based on symptomology, as described in Table 1 (x-axis) was plotted against the IFNg CD4 T cell responses to the total SARS2 response (A), the spike response (B) and the three classes of proteins (structural, accessory and non-structural (C,D and E, respectively)). The r and p values shown in the left corner of each panel were calculated using the Spearman correlation.





Supplemental Figure 3. *IL-2 production of CD4 T cells to conserved peptides shared between sCoV OC43 and SARS-CoV-2 vs. peptides unique to SARS-CoV-2* Curated pools of peptides representing unique and conserved regions of the spike protein were designed based on alignments between seasonal CoV OC43 and SARS-CoV-2 (see supplemental Table 2). Each pool contained an equal number of peptides. CD4 T cell responses from 6 subjects following PCR confirmed SARS-CoV-2 infection (April-May 2020) at a convalescent time point were quantified by IL-2 EliSpot. (IFN- $\gamma$  responses are shown in Figure 8) Shown are the spot counts per million CD8- and CD56- depleted PBMC with background subtracted. The median CD4 T cell response to each peptide pool is shown as a grey bar and individual subjects are indicated by unique symbols.