Supplementary Materials: The following figures contain comparisons of sequence alignments for SARS-CoV-2 (NCBI Reference Sequence: NC_045512.2), SARS-CoV (NCBI Reference Sequence: NC_004718.3), and MERS-CoV (NCBI Reference Sequence: NC_019843.3). The software MEGA-X was used to analyze sequence data. The color coding represents homology of the amino acids between the top and bottom sequence. For amino acid sequences the color coding is as shown below:

Symbol	Color	Symbol	Color
А	Yellow	М	Yellow
С	Olive	Ν	Green
D	Aqua	Р	Blue
E	Aqua	Q	Green
F	Yellow	R	Red
G	Fuchsia	S	Green
Н	Teal	Т	Green
Ι	Yellow	V	Yellow
Κ	Red	W	Green
L	Yellow	Y	Lime

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Species/Abbrv	8 2 2	* 1		1			1	-	1	1.1		1	2 2 2	5 2 2	*	8 8 8	1		2 2 3	1 2 1		2 2 2	8 8	* ×				*	1 1	1 1	1 1	8 8	2 2 3	3 3 3
1. SARS_CoV2_Spike	MFVF	LVLL	PLV	SSQ	CVN	<mark>L</mark>	TTR	TQL	PPA	YTM		FT	RGV	YYP	D <mark>k</mark> v	FRS	SVL	H S T	ODL	FLF	FF	S N V	T W F	HAI	HVS	GTI	GT	k r f	D N P	V L P	FND	GVY	FAST	EKSI
2. SARS	MFIF	LLFL	TLT	SGS	DLD	RCT	TFD	DVQ	APN	YTO	A H T S	SM	r g v	YYP	DEI	FRS	DTL	YLI	OD L	FLF	FY	S N V	TGF	HTI	NHT			F	G N P	VIP	FKD	GIY	FAAT	EKSI
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Species/Abbrv	2 2	* * *	2 2	*	2	* *	2	2.2	* * *	2 2	2	2		2 2	2							2		2 2 1		8	2	1	*	* *	1 2 3	* * * *	* * *	* * *
1. SARS_CoV2_Spike	SNI	RGW	I F <mark>G T</mark>	TLD	S K T	QSL	LIV	N N A	TNV	VI	K V C	FQ	FCN	D P F	LGV	YYH	KNI	I K S I	V M E S	EF	R <mark>V</mark> Y	S S A	N N C	TF	Y۷	S Q P	FLM	DLE	GK	GN	KNL	L <mark>R</mark> E F	VFK	NIDG
2. SARS	SNVV	R G W \	/ F G S	T M N	N K S	QSV	111	NNS	TNV	VI	R <mark>a c</mark> i	FE	LCD	N P F	FAV	S K P	MG		ΤQ	T H T I	N I F	D N A	FNC	TFE	YI	S D A	FSL	DVS	EKS	GN	KHL	L <mark>R</mark> E F	VFK	N K D G
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Species/Abbrv		ε.			2 2 2	1 1	1	1 1		2.2	1.2	1.1.2	.1	1						*	2	1 1 1	1 1	8.8	1	1.2	R 8 R	2 2	2 2 1	1 1 1	2 2 2		2 8 1	t 1 1
1. SARS_CoV2_Spike	YFK	YSKH	H T P I	NLV	RDL	PQG	FSA	LEP	LVD	LP	1 G 1 I	TI	RFQ	TLL	ALH	RSY	LT	GDS	SSSC	SW T /	A G A	AAY	YVG	YLO	PR	FL	LKY	NEN	GTI	T D A	VDC	ALD	PLSE	ткс
2. SARS	FLYN	YKG	YQPI	DVV	RDL	PSG	FNT	LKP	IFK	LPI	LGI	TIV	NFR	AIL	T A F	s		- P /	A Q D	WG	SA.	AAY	FVG	YLK	PTT	FM	LKY	DEN	GT	T D A	VDC	SQN	PLA	LKC
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Species/Abbrv	2.5	t	2 2 2	1.1.1	* * *	2 2	*	2	* * *	* * *	* * * *		* * *	* * *	* *		* * 1			* * *			* * *	2	* * *	* * *	* * *	* *	* * 1	* * *		* * *	* * * *	
1. SARS_CoV2_Spike	TLKS	FTVE	KGI	YQT	S N F	RVQ	PTE	SIV	RFP	NIT	T N L (PF	GEV	FNA	T R F	ASV	YA	V N R F		NC	AD	Y S V	LYN	SAS	FST	FK	CYG	VSP	TKL	NDL	CF	T N <mark>V</mark> Y	ADS	FVIR
2. SARS	s <mark>v k</mark> s	FEID	K G I	YQT	S N F	RVV	PSG		RFP	NI	T N <mark>L (</mark>	C P F	G E V	F <mark>N</mark> A	T K F	PSV	YA	V E R H	(K <mark>I</mark> S		/ A D	Y S V	LYN	STF	FST	T <mark>F K</mark>	C Y <mark>G</mark>	V S A	ТК	N D L	CFS	S N <mark>v</mark> y	A D S F	FVV <mark>K</mark>
												1.1.1		111				1.		11.0	1.1.1						111		1.1.1.		111.	1.1.1		
Species/Abbry																			1.10												1			
1. SARS_CoV2_Spike	GDEV	ROIA	PGQ	TGK	IAD	YNY	K L P	D D F	TGC	VIA	A W N S	S N N	LDS	K <mark>V</mark> G	G N Y	NYL	YRL	FRK	S N L	KPF	ERI	DIS	TEI	YQA	GST	PC	N G V	E G F	NCY	FPL	Q S Y	GFQ	PTNC	G <mark>V</mark> G Y (
2. SARS	GDDV	RQIA	PGQ	TGV	IAD	Y N Y	K <mark>L</mark> P	D D F	MGC	VLA	4 W N 1	r <mark>r</mark> n	I D A	T S T	G N Y	N Y K	YRY	r L R H	GKL	RP	ERI	DIS	N <mark>V</mark> P	FSP	DGK	C P C	T - P	PAL	N C Y	WPL	N D Y	GFY	TTT	G I G Y I
-	11111	191-191	1.1.1.	1.151						Delet	1.1.1		SEC.		A share		EN D			1.1.1.	LLI		1.45	1.1.12	1.1.1	L.L.L				13 Lots	1.1.1	1. I. I.		1111
Species/Abbrv	1 1 1	2 2 2 1	1 2 2 4	2 2	2 2 2	2 2 2	* * *	2 2	*	2 2	* *	* * *	2 2 2	* * *	2 2 2	2 2	2 1	* *	2 2 1	* * * *	2 2 2	*	2 2	* *	2 2	2	2 2 2	* *	* *	* * *	2 2 2	1 * * *	2 2 2	
1. SARS_CoV2_Spike	QPYF	<u>v v v i</u>	SFE	LLH	APA	TVC	G P K	KST	NLV	KN	KCV	FN	FNG	LTG	TGV	LTE	SNE	(K F I	PFO	2 Q F (G R D	IAD	TTD	AVR	DPC	D T L	EIL	DIT	PCS	FGG	VSV	/ T P	GTNT	TSNQ
2. SARS	QPYF	VVVI	SFE	LLN	APA	TVC	GPK	LST	DLI	KN		FN	FNG	LTG	TGV	LTP	SS	(R <mark>F</mark> (2 P F C	QQF	G R D	VSD	FTD	SVR	DPH	(TS	EIL	DIS	PCA	FGG	VSV	/ I T P	GTNA	ASSE
	101				9.6																													

Species/Abbry	1 1
1. SARS_CoV2_Spike	VAVLYDD VNCTEV PVA I HAD OLT PTWRVYSTGSNVFOTRAGCLIGAEHVNNSYECDIPIGAGICASYDTOTNSPRRARSVASOSIIAYTMSLGAENSVAYSNI
2. SARS	VAVLYOD VNCTOVSTAIHADOLT PAWRIYSTGNNVFOTOAGCLIGAEHVDTSYECDIPIGAGICASYHTVSLLRSTSOKSIVAYTMSLGADSSIAYSNI
Species/Abbry	• •
1. SARS_CoV2_Spike	NSIAIPTNETISVTTEILEVSHTKTSVDCTNYICODSTECSNLLLQYOSECTOLNRALTGIAVEODKNTOEVEAOVKOIYKTPPIKDEGGENESOILPDPSKI
2. SARS	N TIA IPTNES IS ITTEVM PVS MAKTS VDC NUY I CODSTECANLLLQYGSECTOLN RALS GIAAEODRNTREVEA OVKONYKTPTLKYEGGENES OIL PDPLKI
0.00000	
Species/Abbrv	
1. SARS_CoV2_Spike	P S K R S F I ED L L F N K V T L AD A G F I K O Y GD C L GD I A A R D L I C A O K F N G L T V L P P L L T D E N I A O Y T S A L L A G T I T S G W T F G A G A A L O I P F A N O NA Y R F N G I G V T O I
2. SARS	PTKRSFIEDLLFNKVTLADAGFNKQYGECLGDINARDLICAQKFNGLTVLPPLLTDDNIAAYTAALVSGTATAGWTFGAGAALQIPFANQNAYRFNGIGVTQI
Species/Abbrv	
1. SARS_CoV2_Spike	NVLYEN OKLIAN OFN SAIGKIOD SLSSTASALGKLOD VVN ON AO ALNTLVKOLSSN FGAISSVLNDILSRLDKVEAEVOID RLITGRLOSLOTYVT OOLIRA/
2. SARS	NVLYENCKOIANOFNKAISOIDESLTTTSTALGKLODVVNONADALNTLVKOLSSNFGAISSVLNDILS <mark>RLDKVEAEVOIDRLITGRLOSLOTVVTOOLIR</mark> A/
Species/Abbry	
1. SARS_CoV2_Spike	A EIRASAN LAATKMSECVLGOSKRVDFCGKGYHLWSFPOSAPHGVVFLHVTYVPAOEKNFTTAPAICHDGKAHFPREGVFVSNGTHWFVTORNFYEPOIITTI
2. SARS	A E I RASAN LAATKMS E CVLGOSKRVD F C GK GYH LWS F P GAAPH GVVF LHVTYVP SOERN F T TAPAICH E GKAYF PREGVF VF NGTSWF I T GRNFFS P O I I T T I
2 Canuanan 1	
Species/Abbry	
1. SARS_CoV2_Spike	DNTFVSGNCDVVIGIVNNTVVDPLQPELDSFKEELDKYFKNHTSPDVDLGDISGINASVVNIQKEIDRLNEVAKNLNESLIDLGELGKYEQYIKWPWYIWLGI
2. SARS	DNTFVSGNCDVVIGIINNTVVDPLQPELDSFKEELDKYFKNHTSPDVDLGDISGINASVVNIGKEIDRLNEVAKNLNESLIDLGELGKYEGYIKWPWVVNGI
0.0	

Figure S1. Sequence alignment of the S protein of SARS-CoV-2 and SARS-CoV.

Species/Abbrv	* *	* *	2 2			*		*	1 1		* * *	* * * *	* *	* *	* *	* * * *	* * *	* * *	* * *			* *	* * *	* * *	* * *	* * * * *
1. SARS_CoV2_S	pike I	N F V F	LVLL	PLVS	SQC	VNLT	TRTQ	LPPA	YTNS	FTR	G <mark>V</mark> YY	PDKV	FRSS	V L H S	TODL	FLP-			- FFS	N <mark>V T W</mark> F	HAIH	<mark>v</mark> s g t	NGTK	RFDN	PVLP	F <mark>NDG</mark> VYF
2. MERS	MI	H S <mark>V F</mark>	LLMF		TES	YVDV	G P D S	V K S A		DIQ	Q T F F	DKTW	PRPI	DVSK	A D G I	I Y P Q	<mark>g r</mark> t y	SNIT	ITYQ	G L F P Y	QGDH	G D M Y	VYS A	GHAT	GTTP	0 K L F V A N
Snecies/Ahhry	1 1 1	1 1	x x	1	1 1	1 1	x x x	1 1 1	1 1	1	2.2	1			1111	1111	1	* * * *	1 1 1		1	1 1 1	x x x	* * * *	* * * *	1 1
1. SARS CoV2 SI	pike <mark>A</mark> ST	EKS	NIR	GWIF	GTTL	DSK	TQSL	LIVN	NATN	VVI	VCE	FQFC	NDPF	LGVY	HKNN	KSW	MESE	FRVY	SAN -	N C	TFEY	VSQP	FLMD	LEGK	QGNF	NLREFV
2. MERS	YSO	DVK		GFVV	RIGA	AANS	STGT	VIIS	PSTS	ATIF	KIY	PAFM	LGSS	VGNFS	DGKI	I G R F	FNHT	LVLL	DGCO	TLLR	AFYC	ILEP	RSGN	HCPA	GNSYT	S F A T Y H
Spacing/Abboy	1			*[*] [*		1.1.1.1						* * * *						[e]=[e]	del e la la	12121 12						
1. SARS CoV2 St	oike <mark>Y Y V</mark>	GYL		FLLK	YNEN	GTI	TDAV	DCAL	DPLS	ETKO	TLK	SETV	EKGI	YOTSI	FRVO	PTE	SIVR	F P N I	NLCF	FGEV	FNAT	RFAS	VYAW	NRKR	ISNCI	ADYSVL
2. MERS	FYV	YKL		FLLD	FSV	GYI	RRAI		NDLS	QLHO	SYE	SFDV	ESGV	YSVSS	FEAR	(P S G	SVVE		VECE	FSPL	LSGT	- P P Q	VYNF	KRLV	FTNC	YNLTKL
	1																									
Species/Abbrv	* * *	2 2		* * * *	* * *	1 4 1		1		2 2 1		1 1	•					2 2		1 1 1	2. 2	2 2 2	1	1 1 1		
1. SARS_CoV2_Sp	DikeY N S	ASF	STFK	CYGV	SPTK	LNDI		VYA			EVR		GOTG	KIADY		PDD	FTGC	VIAWI			GGNY	Y L Y	RLFR	KSNL	K P F E F	DISTEI
2. MERO	LOL	r s v		c su i	SPAP			5111		I PL			5 5 A U	Pipur	H I N	23 <mark>1</mark> 3		LILA	V P N N		INPLI	NI DI	INKC	SKLL	SUUR	CVPULV
Species/Abbrv	2 2	1 1 1	1 1 1 1	1 1 1	1 1	1 1 1	1 1 1 1	1 1 1	1 1 1 1	1 1 1 1	1	1 1	1 2 2 2	1 1 1 1	1	t t	1 7 1	1 1 1	1 1 1	1 1 1	1 1 1 1	1 1 1 1	7 5 7	т т	1 1 1 1	5 2 2 2 2
1. SARS_CoV2_Sp	oike <mark>Y Q</mark> A	GST	PCNG	V <mark>E G</mark> F	NCY-			<mark>F</mark> P	LQSY	GFQF	TNG	VGYQ	PYRV	V V L S F	ELLH	APA	TVCG			PKKS	TNLV	K N K C	V N F N	FNGL	TGTG	ILTESNK
2. MERS	NAN	QYS	PCVS	IVPS	TVWE	DGD	YYRK	Q L S P	LEGG	G W L \	ASG	S T V A	MTEQ		GITV	a y g	TDTN	S V C P I		NDTK	IASQ	LGNC	VEYS	LYGV	S G R G V	FONCTA
Casaiaa/Abbay	11.		* * * *			4 4	el el el el	1.1.1.1	11111	* + *	1 1 + 1 +	* + + + +	+ + + +	* * * * * *		1111	1111		1 + +		* * * * *	1	2 + 2 +		* * * * *	
1 SARS CoV2 Sr	nike <mark>K E I</mark>	PEO			TTDA	VRD		EIID	ITPC	SEGO	vsv	TPG	TNTS	NOVAN		VNC		VAIH		PTWR	VYST	GSNV	FOTR	AGCI	IGAE	VN . NSY
2 MERS	VGV	ROO	REVY		NLVG	YYS	DDG	YYC	LRAC	vsv	vsv	YDK	ЕТКТ	HATLE	GSVA	CEH	ISST	NS O Y	RSTR	SMLK	RRDS	TYGP	LOTP	VGCV	LGLV	SSLEVE
Species/Abbrv	*	1 1 1	* * X	* * * *	2 2 2		* * * *	* * *	* * * *			* * *	* * *				* * *	* * * *			* * * *	* * * *	* *	* * * *	* * * * *	* * * * * *
1. SARS_CoV2_S	pikeE C D	IPI	GAGI	CASY	Q T Q T	INSPR	RRAR	SVAS	QSII	AYTI	SLG	AENS	VAYS	NNS		PTN	FTIS	VTTE	LPVS	MTKT	SVDC	MYI	CGDS	TECS	NLLL	YGSFCT
Z. MERS	UCK	LPL	GUSL	CALP	UTPS		PRSV	RSVP	GEMR	LAS		H P I U	vuu	1 2 2 1 1	KLS	PIN	rarg	VIUE		IUKV	VUC	K U Y V	CNGF	UKCE		TGUTCS
Species/Abbry	1 2 1	1.1	1 1 1 1	1 1 1	1.9 1	1 1 1	* * * *	2 2 2 2	2 3 2 3	2 2 2 1	1 2 X	1 2 3	e e x	8 8 9		1 1 1 1	1 2 3 3	* * * *		* * * *		1 1 1 1	2 2 2 3	1 1 1 1	1 + 1	
1. SARS_CoV2_S	pike <mark>Q L</mark> N	RAL	TGIA	V E Q D	KNTO	EVF/	AQVK	a <mark>iyk</mark>	TPPI	K D F (3 G - F	NFSQ	ILPD	P <mark>S</mark> KP	S P	(R S F	I E D L	L F <mark>N K</mark> V	/ T L A E	AGFI	K Q Y G I	DCLG	D I	AARD		X F N G L T
2. MERS	KIN		HGAN	LRQD	DSVR	R N L F /	ASVK	SSQS	SPII	PGFO	GOF	NLTL	LEPV	SISTO	S R S A	ARSA	EDL			PGYM	QGYDI	DCMQ	QGPA	SARD	LICA	Y V A G Y K
Species/Abbry	1 1	1 1	1	2 2 2	1 1 1 1		* * * *	1 1 1 1	x x x x	8 8 8	1 1 1	1 1 1 1	* * * *	* * * * *	x x x 2	1 1 1		* * * *			* * * *	1 1 1 1	2 2 3 2	1 1 1 1	* * * *	
1. SARS_CoV2_S	pike <mark>V L P</mark>	PLL	TDEM	IAQY	T S <mark>A L</mark>	LAG	TITS	G W T F	G A G A	A L Q	PFA	M <mark>Q</mark> M A	YRFN	GIGV	r a n <mark>v l</mark>	YEN	a k L I .	ANQFI		KIQD	S L S S '	TASA	LGKL		N Q N <mark>A</mark> (ALNTLV
2. MERS	VLP	PLM	DVNM	EAAY	TSSL	LGS	IAGV	GWT <mark>A</mark>	GLSS	FAA	I P F A	QSIF	YRLN	GVGI	raavi	SEN	QKLI.	ANKFI			GFTT	T N <mark>E</mark> A	FQKV	QDAV	N N N <mark>A</mark> (ALSKLA
Snecies/Ahhry	1 1 1	* * *	1 1 1 1	1 2 2 3	1 2 1 1			* * * *	* * * *	1 1	2 2 2	1 1 1 1	1 1 1	1 1 1 1		+ + +	1 1 1	1 1		2 3	1 1 1 1		2 3 5 3		1 2 2 1	
1. SARS_CoV2_S	pike <mark>K Q L</mark>	SSN	FGAI	SSVL	NDIL	SRL	DKVE	AEVQ	IDRL	ITGF	LQS	LQTY	νταα	LIRAA	EIRA	SAN	LAAT	KMSEO	VLGC	SKRV	DFCG	KGYH	LMSF	PQSA	PHGV	FLHVTY
2. MERS	SEL	SNT	F <mark>G</mark> A I	SASI	GDII		D V L E	a <mark>d</mark> a a	I D R L	INGF	R <mark>L</mark> T T	l <mark>n</mark> a f	VAQQ	L V R S E	S A A I	SAQ	LAKD	K <mark>V N E</mark> (C V K A C	ISKR <mark>S</mark>	GFCG	Q <mark>g t</mark> h	I V S F	V V N A	PNGLY	ſFM <mark>HV</mark> GY
						1.1.1.1.1																				
1. SARS CoV2 St		QEK	NETT	APAI	СНДС		KAHE	PREG	VFVS	NGTH	WEV	TORN	FYEP			VSG	CDV	VIGIN		YDPL	OPEL	D S		FKEE	LDKY	KNHTSP
2. MERS	YPS	NHI	EVVS	AYGL		NPTI		P <mark>V</mark> N G	YFIK	TNNT	RIV	DEWS	YTGS	SFYAF	EPIT	T S L N	ΤΚΥν	APQV	YQN	STNL	PPPL	LGNS	TGID	FQDE		K N <mark>V</mark> S T S
	-	Total -	CTOTOT 1			DI L	1111				1111		11.11	and a second	EL LT	1117	1.1.1.1		LILE			IST I				
Species/Abbry			1501	MASV	VNIC	KEL		EVAY	NINC	SIL			FOVI	KWDW		FIA		LVMV	1 1 1 0	CHTC	CCSC.	KOC	0000	S C C Y	EDEC	DSEDVI
2. MERS		FGS	LTQI	NTTL	LDL	YEM	LSLQ	avvk	ALNE	SYIC	LKE	LGNY	TYYN	KWPW	IWL	FIA	GLVA	LALC	/FFIL	CCTG	CGTN	CMGK	LKCN	RCCD	RYEEN	DLEPHK
2 Converso 1																		100								

Figure S2. Sequence alignment of the S protein of SARS-CoV-2 and MERS-CoV.

Species/Abbry	1 1 1 1 1 1 1		* * * * * *	* * * * * * *	2 2 2 1			* * * * *	* * * * * * * *	* * * * * *	* * * * * *	* * * * *	1 1 1 1 1	1 1 1 1 1 1	0. 2. 0. 0. 2. 0. 1. 1
1. SARS-CoV-2_M-ger	ne <mark>M A D S N G T</mark>	I <mark>T V E E L K</mark>	K L L E Q W N	LVI <mark>G</mark> FLF	L T W I C L	L L <mark>Q</mark> F A Y	ANRNRFLY	I I <mark>K</mark> L I F	LWLLWPVT	LACFVL	AAVYRI	N W I T G G	IAIAMAC	L V <mark>G</mark> L M <mark>W</mark> L	SYFIASFRLF
2. SARS_M-gene	MAD - NGT	I T V E E L K	Q L L <mark>E</mark> Q W N	L V I <mark>G</mark> F L F	L A <mark>W</mark> I M L	L L <mark>Q</mark> F A Y	S N R N R F L Y	I I <mark>K</mark> L V F		LACFVL	AAVYRI	N W <mark>v</mark> t g g	IAIAMAC	I V <mark>G</mark> L M <mark>W</mark> L	SYFVASF <mark>R</mark> LF
	10														
Species/Abbry	2 2 2 2 2 2 2	1 1 1 1		1 1 1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1 1 1 1			1 1 1 1 1 1	1 1 1 1	1 1 1 1			* * * * * * * * *
Species/Abbrv 1. SARS-CoV-2_M-get	ne <mark>n V P L H G T</mark>	ITRPLL	s s s s s s s	AVIL <mark>RG</mark> H	r r r r r L <mark>R I A G H</mark>	t t t t	* * * * * * * * D I <mark>K D L P K E</mark>	* * * * * * * I T V A T S F	e = = = = = = = = R T L S Y Y K L	s s s s s s G <mark>asqrv</mark>	x x x x x	a a a a a a a a a a a a a a a a a a a	R I GNYKL)	* * * * * * * I T <mark>D</mark> H <mark>s s s</mark>	s s s s s s s s s S <mark>D</mark> N I A L L V O

Figure S3. Sequence alignment of the M protein of SARS-CoV-2 and SARS-CoV.

Species/Abbrv	t		*			t		* *	ź		* *		2 2		* * * *	* *	t		* * *	t	*		ż	*	* * * *	ż	2 2 2
1. SARS-CoV-2_M-ge	ene M A D	S N G T I	T V E E	LKKL	LEQW	(N L V I	GFL	FLTW	ICLL	QFA	YANR	NRFL	YIIK	LIF	LWLL	W P V 1	LACF	VLA	AVYR	N W I	TGGI	AIAI	ACLV	GLM	N L S Y F	IASF	LF
2. MERS_M-gene	MSN	M T - Q L	TEAQ	IIAI	IKDW	(N F A	IS L I	FLLI	TIVL	Q Y G	YPSR	SMTV	YVFK	MFV	LWLL	WPSS	MALS	IFS	AVYP	DLA	s a I I	SGIN	/ A A V S	AMM	N I S Y F	VQSI	R L F
3 Senijence 1	8																										
Species/Abbrv	* * *	* * *	*	* * *	2		2	2 2 2	2 2	*	* * *		2 2	* * *		2	2			1 1 1	1 1	2 1				2	* *
1. SARS-CoV-2_M-ge	ene <mark>L L N</mark>	V P L H G	TILT	RPLL	ESEL	VIGA	VIL	R <mark>g h l</mark>	RIAG	HHL	GRCD	IKDL	PKEI	TVA	T S R T	LSYY	(<mark>K L G</mark> A	SQR	AGDS	GFA	A Y S R	YRIC	G N Y <mark>k</mark> l	NTD	H S S S S	DNIA	LLV
2. MERS M-gene	LLN	VPFGG	TTVV	RPLV	EDST	SVTA	VVT	NGHL	KMAG	MHF	GACD	YDRU	PNEV	TVA	KPNV	LIAL	KMVK	RQS	GTNS	GVA	IYHR	YKAC	NYR-	- S P	PITAD	IELA	LLR

Figure S4. Sequence alignment of the M protein of SARS-CoV-2 and MERS-CoV.

Species/Abbry	· · · · · · · · · · · · · · · · · · ·
1. RdRp_SARS	SADASTFLNRVCGVSAARLTPCGTGTSTDVVYRAFDIYN EKVAGFAKFLKTNCCRFDEKDEEGNLLDSYFVVKRHTNSNYDHEETIYN LVKDCPAVAVHDFFKFI
2. RdRp_SARS2	SADA OSFLNRVC GVSAAR LTPC GTGT ST DVVYRAFD I YN DKVAG FAK FLK TNCCRFOEK DEDDN LI DSY FVVKRHTFS NY OHEET I YN LLKDC PAVAKH DFFKFI
1 0	
Spaciae/Ahhry	
1. KOKP_SAKS	R VOGUM PHISKURLIKTIMADLVTALKH PUGNCULLKELVITACCUUTTAKKUNTPVERUTLKYTANLOEKVAUSLLKIVUTOAMMUAGTVOVLILU
2. HORP_SARS2	RIDGDWYRHISKORUWYMAULYYALKHIDEGWCDILKEILYWYWCCDDDYYMKKDWYDIYEMPUILKYYANLGERYRMALLKWYOFUAMRMAGIYGYLHU
Species/Abbry	
1. RdRp_SARS	N Q D L N G N WYD F G D F YQ YA P G C G Y P I YD S YYS LL M P I L T L T R A LA A E SH MD AD L A K PL I K WD L L K YD F T E E R L C L F D R Y F K Y MD Q T Y H P N C I N C L D D R C I L H C A N
2. RdRp_SARS2	N Q D L N G N WY D F G D F I Q T T P G S G V P V V D S Y Y S L M P I L T L T R A L T A E S H V D T D L T K P Y I K WD L L K Y D F T E E R L K L F D R Y F K Y WD Q T Y H P N C V N C L D D R C I L H C A N
l	
Snecies/Ahbry	
2 DdDo SADS2	
2. Runp_SARS2	
13. Sequence 1	
Species/Abbry	
1. RdRp_SARS	<u>_KOFYDFAVSKGFFKEGSSVELKHFFFAQDGNAAISOYDYYRYNLPTNCDIROLLFVVEVVDKYFDCYDGGCINANQVIVNNLDKSAGFPFNKWGKARLYYDSNS'</u>
2. RdRp_SARS2	_KOFYDFAVSKGFFKEGSSVELKHFFFADDGNAAISDYDYYRYNLPTHCDIROLLFVVEVVDKYFDCYDGGCINAHQVIVNNLDKSAGFPFNKWGKARLYYDSHS'
· · ·	
Species/Abbry	
1. RdRp_SARS	YED DDALFAY IKRN V IPITTUM LKYAISAKN RARI VAG VSICSIMIN RUHH KLLKSIAAT RGAL VVIGISKIY GOWINMLKI VYSD ET PHUM GWD YPKUM.
2. RURD_SARS2	
Snecies/Ahbry	
1. RdRo SARS	AMPNUL THAS LYLARKHNTCCNLSHRFYRLANECADVLSEWWCGGSLYVKPGGTSSGDATTAYANSVFNLCDAVTANVWALLSTDGWCIADKYVRNLDHRLY
2. RdRp_SARS2	ANPNMLRIMASLVLARKHTTCCSLSHRFYRLANECAQVLSENVMCGGSLYVKPGGTSSGDATTAYANSVFNICQAVTANVNALLSTDGNKIADKYVRNLOHRLY
Species/Abbry	
1. RdRp_SARS	_ ECLYRNRDVDH EFVDEFYAYLRKHFSMMILSDDAVVCYNSMYAA <mark>D</mark> GLVASIKNFKAVLYYDNNVFMSEAKCWTETDLTKOPHEFCSOHTMLVKOGDDYVYLPYPI
2. RdRp_SARS2	ECLYRNRDVDTDFVNEFYAYLRKHFSMMILSDDAVVCFNSTYASOGLVASIKNFKSVLYYDNNVFNSEAKCWTETDLTKGPHEFCSOHTMLVKOGDDYVYLPYPI
Species/Abbry	
1. RdRp_SARS	PYPDPSRILGAGCFVDDIVKTDGTLMIERFVSLAIDAYPLTKHPNQEYADVFHLYLQYIRKLHDELTGHMLDMYSVMLTNDMTSRYWEPEFYEAWYTPHTVLQ
2. RdRp_SARS2	. PYPDPSRIL GAGC FVDD I VKTDGTL NIER FVS LAIDAYPLTKH PNGEYADVFHLYL GYIRKLHDELTGHNL DNYSVNL TNDNTSRYWE PEFYEANYT PHTVL G

Figure S5.: Sequence alignment of the RdRp protein of SARS-CoV-2 and SARS-CoV.

Species/Abbrv	
1. RdRp_SARS2	<u>sadaosfinrvog-vsaaritpogtgtstovvyrafdiyndkvagfakfiktnoorfgekdeddniidsyfvvkrhtfsnydheetiynlikdopavakhdf</u>
2. RdRp_MERS	SK D S N F L N R V R G S I V N A R I E PC S S G L S T D V V F R A F D I C N Y K A K V A G I G K Y Y K T N T C R F V E L D D G G H H L D S Y F V V K R H T N E N Y E L E K H C Y D L L R D C D A V A P H D F I
Species/Abbry	
1. RdRp_SARS2	_FKFRIDGDMVPHISRORLTKYTMADLVYALRHFDEGNCDTLKEILVTYNCCDDDYFNKKDWYDFVENPDILRVYANLGERVROALLKTVOFCDAMRNAGIVGVL
2. RdRp_MERS	_FIFDVDKVKTPHIVRORLTEVTNNDLVYALRHFDO.NSEVLKAILVKYGCCDVTYFENKLWFDFVENPSVIGVYHKLGERVROAILNTVKFCDHMVKAGLVGVL
0	
Species/Abbry	
1. RdRp_SARS2	TLONGOLNGNWYDFGOFIOTTPGSGVPVOSYYSLLNPILTLTRALTAESHVDTOLTKPYTKWOLLKYDFTEERLKLFDRYFKYWDGTYHPNCVNCLODRCILHI
2. RdRp_MERS	TLONGOLNGKWYDFGOFVITGPOSGVAIVOSYYSYLMPVLSMTDCLAAETHROCDFNKPLIEWPLTEYDFTDYKVQLFEKYFKYMDGTYHANCVNCTDDRCVLHI
Snecies/Ahhry	
1 PdPn SARS2	CANENY LESTVEDDTE FOLVOKIEVNOV EVVETEVNOV FOLOVINONVNI HEEDISEVELIVAAN JANKANENII I NKOTTE EVAALTNIVAENTVKORI
2 DdDo MEDE	
2. Rurp_wicks	
Species/Abbrv	
1. RdRp_SARS2	N FNKD FYD FAVSKGFFKEGSSVELKH FFFADDGNAAISDYD YYRYN LPTUCD IR DLLFVVEVVD KYFD CYD GCINAN OVI VNN LD KSAGFPFNKWGKARLYYD:
2 RdRo MERS	N FN OD FYD FVV SK G FFK EGS SVTLKH FFFAD DGNAAITD YN YY SYNL PTUCDIK DUL FCUEVVWKY FE LYDGGCLNAS EVVVNN LDK SAGH PFNK FGK AR VYY EL
Species/Abbry	
1. RdRp SARS2	L FAYTKRNYI PTITOWNUKYAI SAKWRARTVAGVSI CSTWTNROFHOKULKSIAATRGATVYIGTSKFYGGWHWUKTVYSDVENPHUWGWDYPKCORAMPNULI
2. RdRp_MERS	LFANTKRNVIPTNTONNLKYAISAKNRARTVAGVSILSTNTNROYHOKNLKSMAATRGATCVIGTTKFYGGWOFNLKTLYKOVDNPHLNGWOYPKCORANPNNCI
0	
Species/Abbry	
2 DdDn MEDS	RINAS LELANDI LOSIS NETRIA ECAULES EVINCOS LIVEGO TO CALVAS VELICARIAN ALLS IDENTANTA VALUAR LECLERAL
2. Nutp_mento	
Species/Abbrv	
1. RdRp_SARS2	R UVD TUFVNEFY A YL KKH FSMIT I SODAVVCFNSTVA SOCUVASIKN FKSVLVYDNN VFNSEAKCWTETDLTKCPHEFCSOHTULVKOGODYVYL PYPD PSRIL
Z. HORP_MERS	IN STATE VINTET TO THE SAME TO SUBSEVE YN SUFAAK SY TAG I UNFREILLY YWN NY FISEAC WYELULRK SPHEFESSCHILLY IR GODGYFL PY POPSRILL
Species/Abbry	
1. RdRp_SARS2	PYPPPSRILGAGGFVDDIVKTDGTLMIERFVSLAIDAYPLIKHPNDEYADVFHLYLDYIRKLHDELTGHMIDMYSVMLTHDNTSRYWEPFFYEAWYTPHTVLD
2. RdRp_MERS	PYPUPERIUSAGCFYDDIVKTDGTUVVERFYSLAIDAYPLIKHEDIEYONYFWYLDYIEKLYKDLIGHMLDSYSVMLCGDNSAKFWEEAFYRDLYSSPITLD

Figure S6. Sequence alignment of the RdRp protein of SARS-CoV-2 and MERS-CoV.

N	
Species/Abbrv	***************************************
1. Helicase_SARS2	2 AVDALCEKALKYLPIDKCSRIIPARARVECFDKFKVNSTLEQYVFCTVNALPETTADIVVFDEISMATNYDLSVVNARLRAKHYVYIGDPAQLPAPRTLLTKGT
2. Helicase_SARS	AVDALCEKALKYLPIDKCSRIIPARARVECFDKFKVNSTLEOYVFCTVNALPETTADIVVFDEISMATNYDLSVVNARLRAKHYVYIGDPAQLPAPRTLLTKGT
Species/Abbry	
1. Helicase SARS2	Z LEPEYFNSVCR LNKT I GPDMFL GTCRRCPAE I VDTVSAL VYDNK LKAHKDKSADCFKMFYKGV I THDVSSAI NRPOI I GVVREFLTRN PAWRKAVFI SPYNSONA'
2. Helicase SARS	LEPEYENSVCRLMKTIGPDMFLGTCRRCPAEIVDTVSALVYDNKLKAHKDKSAUCFKMFYKGVITHDVSSAINRPOIGVVREFLTRNPAWRKAVFISPYNSONA'
l	
Species/Abbry	
1. Helicase_SARS2	E FLTRN PAWRKAVF I S PYN S ON AVASKI L GLPTOT VDSSOGSEYDYV I FTOTTETAH SCN VNR FN VAITRAKVGI L CINSDRDLYDKLOFTSLE I PRRN VATLO
2 Halassa CADC	
Snecies/Ahhry	
1 Halicasa SADS2	A VOACUL CHEMTEL DE AALIDD DEL ERVERVAN VIETENNI VIEVNEVENADER NYT NYT NY DENNEVYCKENYDDIE EDL CAMANYES I VMMT AV GEMU'T
1. Helicase_SARS2	
2. Helicase_SAKS	AV BACVLCHSUISLKUBACIKKE FLUCKCUTUHVISISHKLVLSVN FIVUHAPBUSVIDVIDVIDUTLEGHSTICKSHKEPISFFLUAHGUVIDLIKH UVOSDNVI
	1
Species/Abbry	***************************************
1. Helicase_SARS2	POFNA IATCOWTNAGDY I LANTCTERIKI FAAETIKATEETIKI SYG IATVREVI SORELHI SWEVOK PRPPINRNYVFT GYRVTKNSK VO I GEYTFEK GDYGDA'
2. Helicase SARS	D F NA IATC DWT NAGDY I LANTCTER I K LFAAET I KATEET FKLSYG IATVREVLSDREL H LSWEVGK PR PP L NR NYVFT GYR YTKNSK VOI GEYT FEK GDYGDA'
Species/Abbry	
1. Helicase_SARS2	2 VVYRGTTTYKLNVGDYFVLTSHTVNPLSAPTLVP <mark>OE</mark> HYVRITGLYPTLNISDE FSSNVANYOKVGNOKYSTLQGPPGTGKSHFAIGLALYYPSARIVYTACSHA,
2. Helicase_SARS	VVVRGTTTYKLNVGDYFVLTSHTVNPLSAPTLVPQEHYVRITGLYPTLNISDEFSSNVANYQKVGMQKYSTLQGPPGTGKSHFAIGLALYYPSARIVYTACSHA,

Figure S7. Sequence alignment of the helicase protein of SARS-CoV-2 and SARS-CoV.

Species/Abbry	* * *	*	*				1	1 1	*	* *	* *	1 1	* *	* * 1			* *	*	*	*		* *	*	* *	* *	* *	* *	1	1 1		* *	* *	* *	* *	1		1	*		2 2	1		1	1 1		1 1		1	1		Ī
1. Helicase_SARS2	AVG	AC	VL	CN	S Q 1	SI	R	CG	AC	R	RP	FL	C C	KCO	Y	DH	۷I	ST	SH	KL	۷L	s v	NP	YV	CN	A P	GC	V		/ T 0	LY	LG	GM	SY	YC	KS	HK	P P I	SF	PL	C A	A N G	٥٧	F	LY	KN	TC	VG	S D I	NV	1
2. Helicase_MERS	A V G	S C	VV	C H	S Q 1	r s I	R	CG	ТС	RI	RP	FL	C C	KCC	C Y	DH	V I	AT	PH	KM	۷L	s v	S P	Y۷	CN	A P	GC	V S	S D \	/ T K	LΥ	LG	G M	s Y	FC	VD	H R	PVC	S F	PL	C A	A N G	L٧	F	LY	KN	MC	TG	SP	S 1	1
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Species/Abbrv * *		* * *	* * * *	* *	* * *	* * *	* * *		* * *	*	* *	* *		*		*	*	# #	* *	* * *	* * *	* * *	* * *		* *	* *	* * *	* * *	2 2	* 1	t	
1. Helicase_SARS2 D F N A 1	ATCDWTNA	GDYI	LANT	CTER	LKL	FAA	ETI	KA	TEET	FKI	LSY	GIA	TVR	E V L	S D R	ELH	LSI	NEV	GKPR	PPI	NR	NYV	FTO	YRV	TK	NS	KVQ	GE	r T F	EKGC	YGI	A'
2. Helicase_MERS EFNRL	ATCDWTES	GDYT	LANT	T T E P	L K L	FAA	ETL	RA	TEEA	SK	a s y i	AIA	тік	IV	GER	QLL	. L V	NEA	GKSK	PP	NR	N Y V	FTO	YHI	ΤK	NS	κ <mark>ν</mark> α	GE	(F	ERIC	YSI	A'

Species/Abbry	2	*		*	* *	* 1		* *	*	2 2	*	1 1	2	*	*	*	* *		1	1	2 1	1		* *	* *	*			* *	ż	1	* *	*	*	1	1		2	* * *			* *	* *	* *	* *	* *	t 1	*	2 2	1	* *	* * *	* *
1. Helicase_SARS2	٧V	YF	G	ΤT	TY	ĸ	N	V G	DY	F١	L	r s	T	VM	PL	S A	PT	L١	PC	E	HY V	RI	T	GL	YP	ΤL	N I	S D	EF	SS	NV	AN	YQ	ĸv	GM	Q K 1	S	L	2 G I	p p (G T (K	S H	FA	I G	LAI	YY	PS	A R	IV	ΥT	ACS	H A ,
2. Helicase_MERS	VS	Y	S	S T	TY	ĸ	T.	V G	DI	F١	L	r s	S	V A	ΤL	ΤA	PT	I۱	NC	E	R Y V	KI	T	GL	YP	T I	τV	PE	ĒF	AS	H V	AN	F۵	KS	GY	S K 1	(V	V	2 G I	P P C	G T (K	S H	FA	I G	LAI	YY	PT	<mark>a</mark> R	٧V	ΥT	A C S	Η <mark>Α</mark> ,
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1. Helicase_SARS2	L	EP	EY	FN	S V (RL	MKT	IG	PD	M F	LGT	CR	RCF	AE	IV	D T V	S A	LVY	DN	K L K	A H H	K D K	S A	Q C F	KM	FYK	GVI	TH	VS	S A	I N R	PQI	GVV	RE	FL	T R N	PAV	RK	A V F	15	P <mark>Y</mark> N	SQN	A'
2. Helicase_MERS	L	E P	EN	FN	۷	RL	MCN	LG	PD	I F	LSM	CY	RCF	KE	IV	s t v	S A	LVY	N N	K L L	AKł	K E L	SG	Q C F	KI	LYK	G N V	T H C	AS	S A	I N R	P Q L	TFV	KN	FΙ	TAN	PAV	V S K	A V F	15	P <mark>y</mark> n	SQN	Α'

Species/Abbrv	2	2	* * *	2	* * *	2 2 1	2 2	1 1	2 2	2 2	*		1	1 1	1	* *	2	* *	* *	2 2	1 1			* *	1	*	*	2 2		2	2 1	1	* *	* *	2 2	2	2	1 1	*	*		2		1	•	* *	t						1
1. Helicase_SARS2	FL	TR	N P A	WR	KAN	/ F	S P	YN	s Q	NA	VA	s K	I L	3 L	PT	QT	۷	D S	s Q	GS	E	DY	V	I F	τQ	ΤT	ET	A H	s C	NV	/ N F	F	V.	A I	TR	AK	VG	۱L	. C I	MS	DR	DL	Y	KL	Q	FT	S L	ĒI	PR	RN	V.	A T	LQ
2. Helicase_MERS	FI	TA	NPA	WS	KAN	/ F	SP	YN	SQ	N A	VS	R S	I L	L	ΤT	QT	V	D S	S Q	GS	E	ay	V	I F	CQ	A	D T .	A H	AN	NI	NF	F	V.	A I	TR	٩Q	KG	I L	. C V	M	SQ	ΑL	F	S I	Ē	FT	EL	S F	TN	YK	L	۵.	

Figure S8. Sequence alignment of the helicase protein of SARS-CoV-2 and MERS-CoV.