

**Table S1. Additional information on selected betacoronavirus genomes.**

GenBank accession	Virus	Subgenus	Isolate/strain	Host	Date published	Authors
AY686863	SARS-CoV	<i>Sarbecovirus</i>	A022	<i>Paguma larvata</i>	06/2004	Xu et al.
DQ011855	Porcine hemagglutinating encephalomyelitis virus (PHEV)	<i>Embecovirus</i>	VW572	<i>Sus scrofa</i>	04/2005	Vijgen et al.
DQ022305	Bat SARS-like CoV HKU3	<i>Sarbecovirus</i>	HKU3-1	<i>Rhinolophus sinicus</i>	04/2005	Lau et al.
KF367457	Bat SARS-like CoV WIV1	<i>Sarbecovirus</i>	WIV1	<i>Rhinolophus sinicus</i>	07/2013	Ge et al.
KF906249	Dromedary CoV HKU23	<i>Embecovirus</i>	HKU23-265F	<i>Camelus dromedarius</i>	11/2013	Woo et al.
KF917527	MERS-CoV	<i>Merbecovirus</i>	MERS-CoV-Jeddah-Camel-1	<i>Camelus dromedarius</i>	12/2013	Azhar et al.
MF593268	<i>Neoromicia</i> bat CoV	<i>Merbecovirus</i>	Neoromicia/5038	<i>Neoromicia capensis</i>	07/2017	Geldenhuys et al.
MG772933	Bat SARS-like CoV SL-CoVZC45	<i>Sarbecovirus</i>	Bat-SL-CoVZC45	<i>Rhinolophus sinicus</i>	01/2018	Hu et al.
MG772934	Bat SARS-like CoV SL-CoVZXC21	<i>Sarbecovirus</i>	Bat- SL-CoVZXC21	<i>Rhinolophus sinicus</i>	01/2018	Hu et al.
MK907286	Hedgehog CoV HKU31	<i>Merbecovirus</i>	F6	<i>Erinaceus amurensis</i>	05/2019	Lau et al.
MN996532	Bat SARS-like CoV RaTG13	<i>Sarbecovirus</i>	RaTG13	<i>Rhinolophus affinis</i>	01/2020	Zhu et al.
MT040333	Pangolin CoV	<i>Sarbecovirus</i>	PCoV_GX-P4L	<i>Manis javanica</i>	02/2020	Cao et al.
MT365033	SARS-CoV-2	<i>Sarbecovirus</i>	SARS-CoV-2/tiger/NY/040420/2020	<i>Panthera tigris jacksoni</i>	04/2020	Mitchell et al.
NC_003045	Bovine CoV	<i>Embecovirus</i>	BCoV-ENT	<i>Bos taurus</i>	08/2001	Chouljenko et al.
NC_004718	SARS-CoV	<i>Sarbecovirus</i>	Tor2	<i>Homo sapiens</i>	04/2003	BCCA Genome Sciences Centre, Canada (Consortium)
NC_006213	Human CoV OC43	<i>Embecovirus</i>	ATCC VR-759	<i>Homo sapiens</i>	03/2004	St-Jean et al.
NC_001846	Mouse hepatitis virus (MHV)	<i>Embecovirus</i>	MHV-A59	<i>Mus musculus</i>	10/1997	Weiss et al.
NC_006577	Human CoV HKU1	<i>Embecovirus</i>	HKU1	<i>Homo sapiens</i>	04/2004	Woo et al.
NC_009019	<i>Tylonycteris</i> bat CoV HKU4	<i>Merbecovirus</i>	HKU4-1 B04f	<i>Tylonycteris</i> sp.	10/2006	Woo et al.

NC_009020	<i>Pipistrellus</i> bat CoV HKU5	<i>Merbecovirus</i>	HKU5-1 LMH03f	<i>Pipistrellus</i> sp.	10/2006	Woo et al.
NC_009021	<i>Rousettus</i> bat CoV HKU9	<i>Nobecovirus</i>	HKU9-1 BF_005I	<i>Rousettus</i> sp.	10/2006	Woo et al.
NC_012936	Rat CoV Parker	<i>Embecovirus</i>	Parker	<i>Rattus norvegicus</i>	04/2009	Spiro et al.
NC_019843	MERS-CoV	<i>Merbecovirus</i>	EMC/2012	<i>Homo sapiens</i>	10/2012	van Boheemen et al.
NC_025217	Bat Hp-BetaCoV Zhejiang2013	<i>Hibecovirus</i>	Zhejiang2013	<i>Hipposideros pratti</i>	09/2013	Wu et al.
NC_026011	China <i>Rattus</i> CoV HKU24	<i>Embecovirus</i>	HKU24-R050051	<i>Rattus norvegicus</i>	08/2014	Lau et al.
NC_030886	<i>Rousettus</i> bat CoV GCCDC1	<i>Nobecovirus</i>	GCCDC1 356	<i>Rousettus leschenaulti</i>	02/2006	Huang et al.
NC_045512	SARS-CoV-2	<i>Sarbecovirus</i>	Wuhan-Hu-1	<i>Homo sapiens</i>	01/2020	Wu et al.