

# WHAT IS SARS-COV-2 /COVID-19?

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# INTRODUCTION

Coronavirus is a general term for a virus that exists widely in nature. Coronavirus was first discovered in 1968, and was officially named the Coronavirus family in 1975 by the International Virus Naming Commission. Under the electron microscope, they can be observed that there are corona-like radial protrusions on their surface, about 80-120 nm. It looks like a crown, so it's named Coronavirus. From the perspective of systematic classification, coronaviruses belong to the order Nidovirales, Coronaviridae, and Coronavirus.

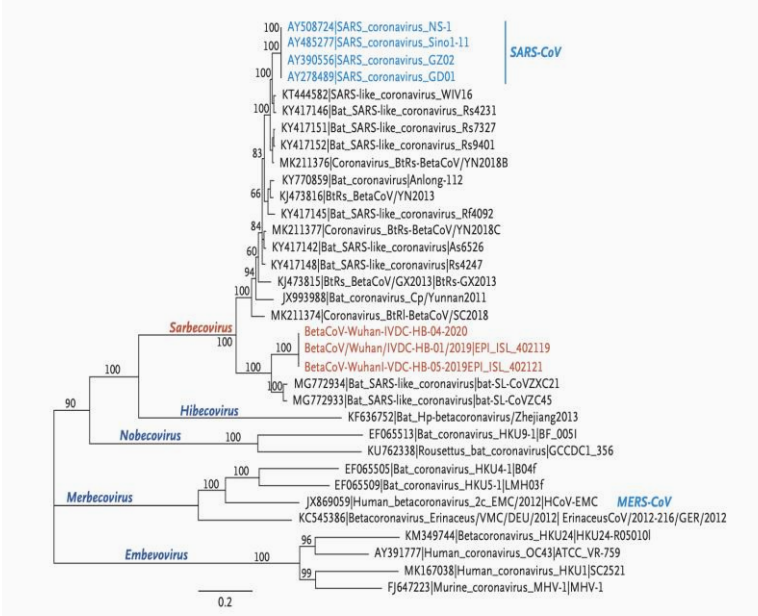


Fig 1. Phylogenetic Analysis of 2019-nCoV and Other Betacoronavirus Genomes in the Orthocoronavirinae Subfamily (Na Zhu, et al. 2020)

Coronaviruses are divided into four genera:  $\alpha$ ,  $\beta$ ,  $\gamma$ , and  $\delta$ . The coronaviruses that infect mammals are mainly  $\alpha$  and  $\beta$  coronaviruses; the coronaviruses that infect birds are mainly derived from  $\gamma$  and  $\delta$  coronaviruses.

Of the coronaviruses discovered to date, only seven have been found to infect humans. Among them, HCoV-229E and HCoV-NL63 belong to the  $\alpha$  genus coronavirus, and HCoV-OC43, SARS-CoV, HCoV-HKU1, MERS-CoV, and 2019-nCoV belong to the  $\beta$  genus coronavirus. Although both SARS-CoV and 2019-nCoV belong to the  $\beta$  coronavirus, they are not the same.

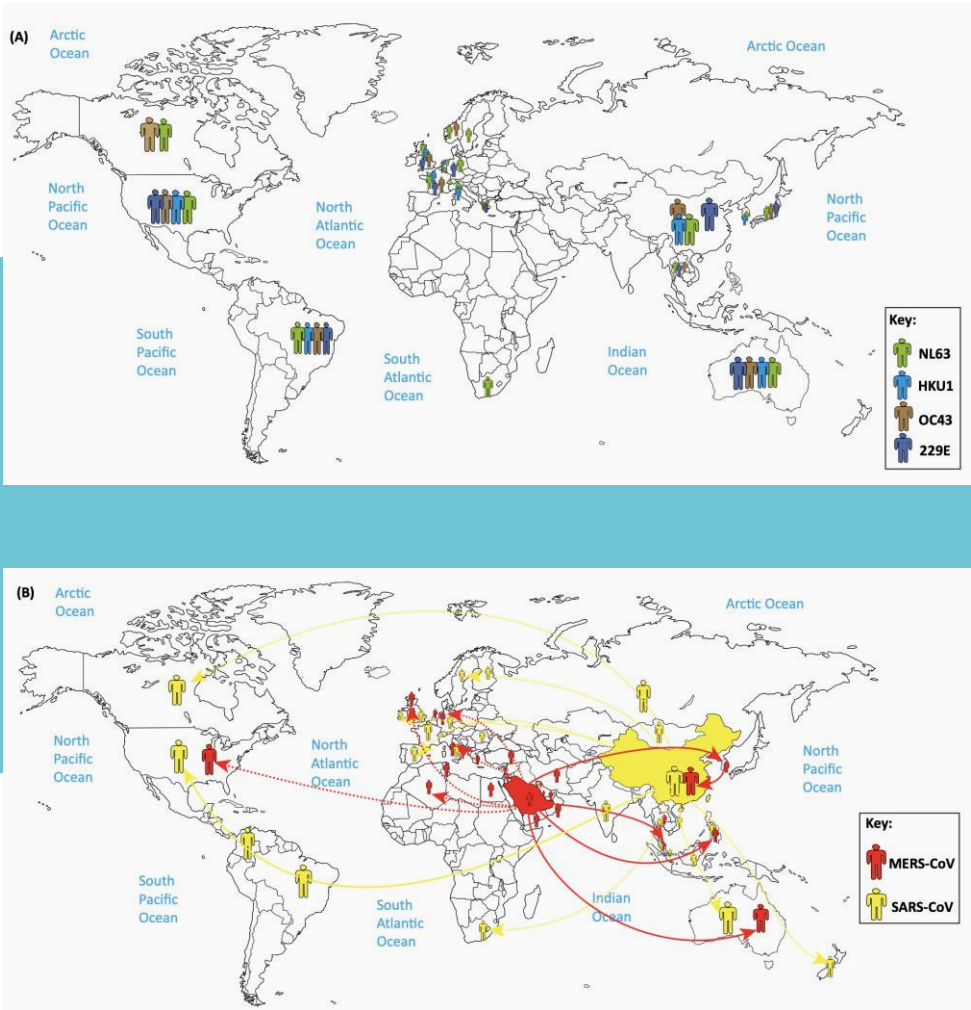
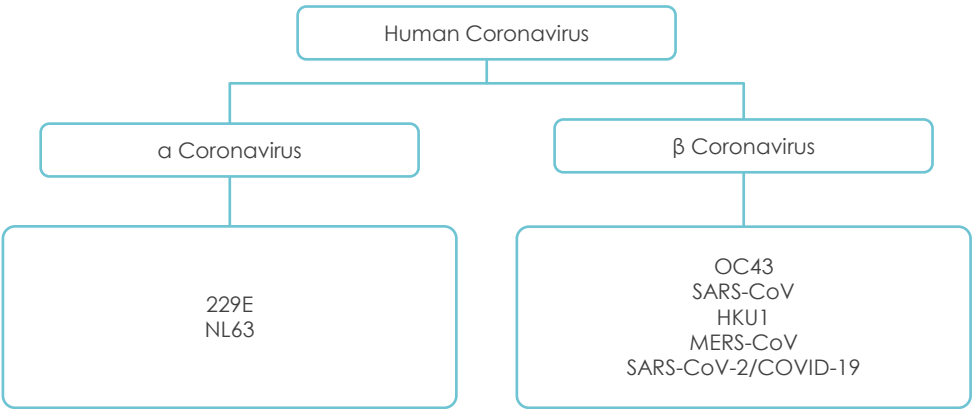


Figure 2. Global Distribution of Human Coronaviruses. (A) Green, blue, brown, and purple represent the global distribution of the NL63, HKU1, OC43, and 229E human coronaviruses, respectively. (B) Red and yellow represent the global distribution of MERS-CoV and SARS-CoV, respectively. (Shuo Su, et al. 2016)



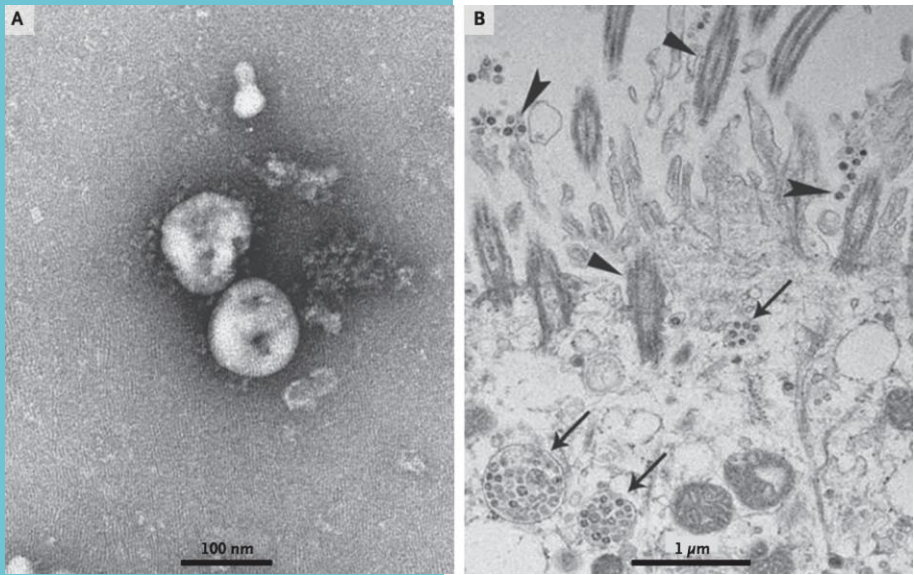


Figure 3. Visualization of 2019-nCoV with Transmission Electron Microscopy. (Na Zhu, et al. 2020)

Coronaviruses bind to host receptors through the S protein, which infects host cells. Coronavirus S protein has high diversity and complex mechanisms.

Studies show that SARS-CoV-2/COVID-19 can enter cells through ACE2 receptors on the surface of cell membranes, which is the same pathway as SARS-CoV enters cells (Hansen Chen, et al. 2020). This also proves the close relationship between the origin of SARS-CoV-2/COVID-19 and SARS-CoV, and belongs to the SARS-associated coronavirus.

Table. Receptors of some coronavirus

Virus	Receptors
HCoV-229E	APN
HCoV-NL63	<a href="#">ACE2</a>
<a href="#">IGEV</a>	APN
<a href="#">PEDV</a>	APN
<a href="#">FIPV</a>	APN
CCoV	APN
<a href="#">MHV</a>	<a href="#">mCEACAM</a>
BCoV	N-acetyl-9-O-acetylneuraminic acid
<a href="#">SARS-CoV</a>	<a href="#">ACE2</a>
<a href="#">MERS-CoV</a>	<a href="#">DPP4</a>
<a href="#">SARS-CoV-2/COVID-19</a>	<a href="#">ACE2</a>

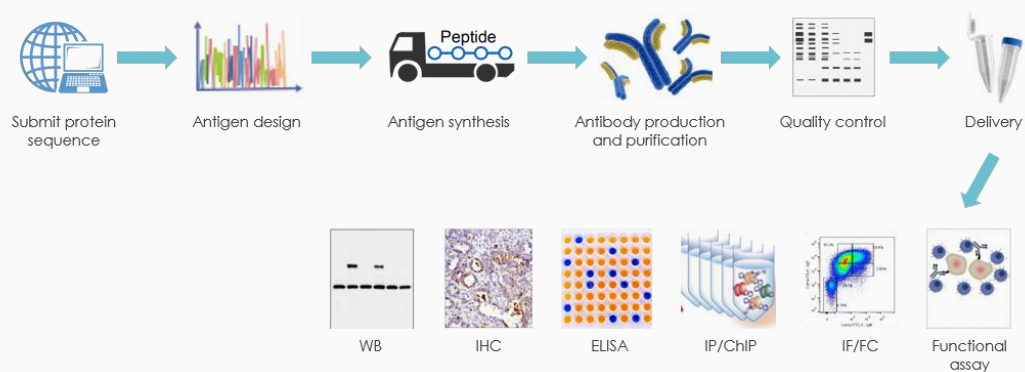
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Targets	Clone	Applications	Species Reactivity	Cat.
SARS-CoV-2 N	CBFYR-0117	ELISA, WB	2019 Novel Coronavirus	<a href="#">CBMAB-R0117-FY</a>
SARS-CoV-2 N	CBFYR-0118	ELISA, WB	2019 Novel Coronavirus	<a href="#">CBMAB-R0118-FY</a>
SARS-CoV-2 S1	CBFYR-0119	ELISA, WB	2019 Novel Coronavirus	<a href="#">CBMAB-R0119-FY</a>
SARS-CoV-2 S1	CBFYR-0120	ELISA, WB	2019 Novel Coronavirus	<a href="#">CBMAB-R0120-FY</a>
SARS-CoV-2 S2	CBFYR-0121	ELISA, WB	2019 Novel Coronavirus	<a href="#">CBMAB-R0121-FY</a>
SARS-CoV-2 Spike	CBFYR-0122	ELISA, WB	2019 Novel Coronavirus	<a href="#">CBMAB-R0122-FY</a>
SARS-CoV-2 Spike	CBFYR-0123	WB, ELISA, IHC-P, FC, IF, IP	2019 Novel Coronavirus	<a href="#">CBMAB-R0123-FY</a>
SARS-CoV-2 NP	CBFYR-0124	WB, ELISA, IHC-P, FC, IF, IP	2019 Novel Coronavirus	<a href="#">CBMAB-R0124-FY</a>

Targets	Clone	Applications	Species Reactivity	Cat.
SARS-CoV Nucleoprotein	CBMC-C0006	ELISA, IHC, FC, IF	SARS Coronavirus	<a href="#">CBMAB-V208-0146-CQ</a>
SARS-CoV Nucleoprotein	CBMC-C0005	ELISA, FC	SARS Coronavirus	<a href="#">CBMAB-V208-0139-CQ</a>
SARS-CoV M	CBMW-H1368	ELISA, WB	SARS Coronavirus	<a href="#">CBMAB-V208-1726-FY</a>
SARS-CoV E	CBMW-H1506	ELISA, WB	SARS Coronavirus	<a href="#">CBMAB-V208-1832-FY</a>
SARS-CoV S	CB2	ELISA, WB	SARS Coronavirus	<a href="#">CBMAB-V208-006LY</a>
MERS-CoV S	CBMC-C0010	Neut	MERS Coronavirus	<a href="#">CBMAB-V208-0904-CQ</a>
MERS-CoV NP	CBMC-C0009	WB, ELISA, IHC-P, FC, IF, IP	MERS Coronavirus	<a href="#">CBMAB-V208-0192-CQ</a>
MERS-CoV	CBMY-C0423	ELISA	MERS Coronavirus	<a href="#">CBMAB-V208-C0435-YY</a>
TGEV	CBMY-C0251	ELISA	Transmissible gastroenteritis coronavirus	<a href="#">CBMAB-V208-C0254-YY</a>
TGEV	CBMC-C0711	ELISA	Transmissible gastroenteritis coronavirus	<a href="#">CBMAB-V208-1732-CQ</a>
PEDV	CB3275	ELISA, FC, WB	Porcine Epidemic Diarrhea Virus	<a href="#">CBMAB-MD402-LY</a>
PEDV	CB3276	ELISA, WB	Porcine Epidemic Diarrhea Virus	<a href="#">CBMAB-MD401-LY</a>
FIPV	CBMW-H1779	ELISA, IF, IHC, WB	Feline infectious peritonitis virus	<a href="#">CBMAB-V208-1679-FY</a>
MHV-A59 nsp9	CBMW-H0671	IF, WB	Mouse hepatitis virus	<a href="#">CBMAB-V208-0753-FY</a>
ACE2	CBYC-A210	WB, IP	Human	<a href="#">CBMAB-A0566-YC</a>
ACE2	CBYC-A206	WB	Human	<a href="#">CBMAB-A0562-YC</a>
ACE2	AC384	ELISA, WB	Human	<a href="#">CBMAB-A0559-YC</a>
CEACAM16	SU-9D5	IHC-P, ELISA, FC	Human	<a href="#">CBMAB-C10865-LY</a>
CEACAM5	PARLAM 4	FC, IF, IHC, WB	Human	<a href="#">CBMAB-C2218-CN</a>
CEACAM1/5/6/8	TET2	IHC, ELISA, IF, WB, FC	Human	<a href="#">CBMAB-C2180-CN</a>
DPP4	CBDH596	IF, IP	Human	<a href="#">CBMAB-DH596-LY</a>
DPP4	D6D8K	WB, IP, IF (ICC)	Human	<a href="#">CBMAB-CP0497-LY</a>
DPP4	MM0249-1G24	WB, FC	Human	<a href="#">CBMAB-DH596-LY</a>

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