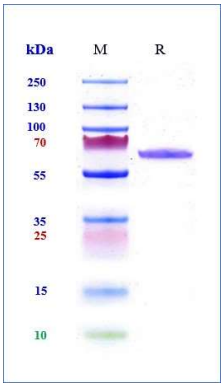
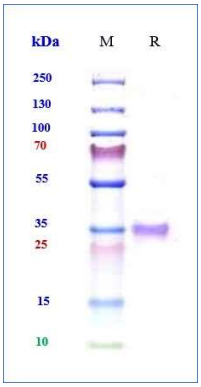
Datasheet for SARS-CoV-2 Related Products

Spike-Protein Receptor Binding Domain (S-protein-RBD)

Cat. No.	Product name	Tag	Species	Expression Host	Quantity
nCoV-p006	Spike RBD antigen	C-Fc	SARS-CoV-2	Expi293	100μg/200μg/500μg/1mg
nCoV-p007	Spike RBD antigen	C-His	SARS-CoV-2	Expi293	100μg/200μg/500μg/1mg
nCoV-mA001	Anti-Spike-RBD human mAb (IgG)		human	Affinity: 1.07nM	100μg/200μg/500μg/1mg
nCoV-mA003	Anti-Spike-RBD human mAb (IgG)		human	Affinity: 0.38nM	100μg/200μg/500μg/1mg
nCoV-mA004	Anti-Spike-RBD human mAb (IgG)		human	Affinity: 0.3nM	100μg/200μg/500μg/1mg
nCoV-mA005	Anti-Spike-RBD human mAb (IgM)		human		100μg/200μg/500μg/1mg
nCoV-mA013	Anti-Spike-RBD human mAb (IgG)		human	Affinity: 0.56nM	100μg/200μg/500μg/1mg
nCoV-mA014	Anti-Spike-RBD human mAb (IgG)		human	Affinity: 0.76nM	100μg/200μg/500μg/1mg
Antibody - Llama					
nCoV-AmA001	Anti-Spike-RBD single domain mAb		Alpaca		100μg/200μg/500μg/1mg
nCoV-AmA002	Anti-Spike-RBD single domain mAb		Alpaca		100μg/200μg/500μg/1mg
nCoV-AmA003	Anti-Spike-RBD single domain mAb		Alpaca		100μg/200μg/500μg/1mg
nCoV-AmA004	Anti-Spike-RBD single domain mAb		Alpaca		100μg/200μg/500μg/1mg



P006 RBD-Fc



P007RBD-His

Fig.1 Tris-bis image of RBD-Fc (nCoV-P006) and RBD-His (nCoV-P007).

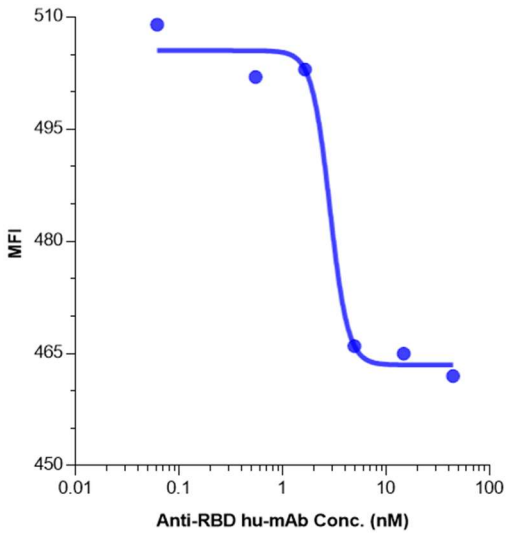


Fig.2 RBD binding and anti-RBD human antibody (huAb) blocking assay. Tested by FACS.

ACE2 expressing Vero E6 cell line was constructed ahead of the test. Cells are suspended in PBS and S-protein-RBD was added to the buffer. An increasing series of RBD huAb was added into the reaction system to block the activity of RBD. S1 huAb was used to detect ACE binding RBD in FACS.

Conclusion: 1: RBD is able to bind Vero E6 expressed human ACE2; 2: RBD huAb is able to block the RBD binding activity; 3: S1 antibody is able to detect binding S-protein. nCoV-mA001, 003, 004 all tested by FACS and the result does not show significant difference.

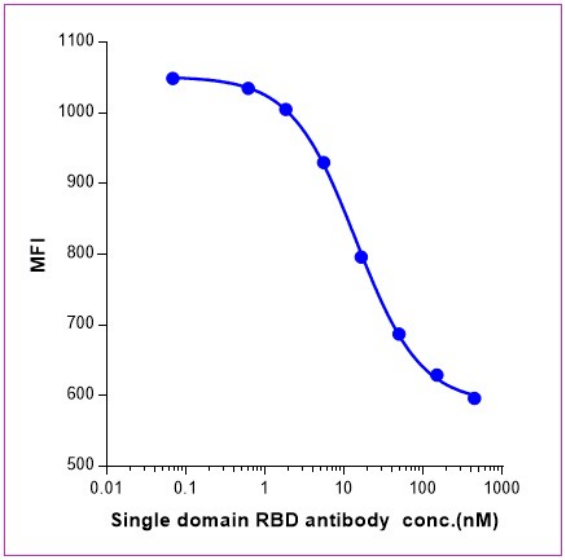


Fig.3 RBD binding and anti-RBD single domain antibody (sdAb) blocking assay. Tested by FACS.

ACE2 expressing Vero E6 cell line was constructed ahead of the test. Cells are suspended in PBS and S-protein-RBD was added to the buffer. An increasing series of RBD sdAb was added into the reaction system to block the activity of RBD. S1 antibody was used to detect ACE binding RBD in FACS.

Conclusion: 1: RBD is able to bind Vero E6 expressed human ACE2; 2: RBD sdAb is able to block the RBD binding activity; 3: S1 antibody is able to detect binding S-protein.

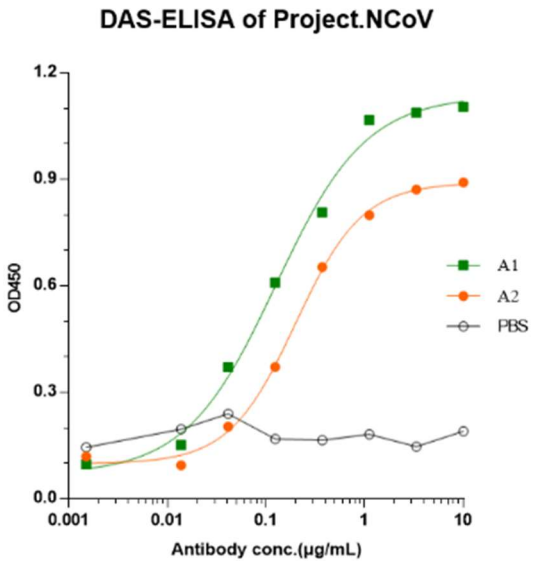


Fig.4 DAS ELISA test antibody pairs among Anti-Spike-RBD human mAb (mA001, mA003 and mA004).

mA003 was coated on 96-well ELISA plate. S1 subunit was added into the well. Then mA001 or mA004 were added into the well to form the Sandwich structure, separately. Signal was read at OD450.

Result show that 2 antibody pairs can be formed: mA001 and mA003; mA003 and mA004.

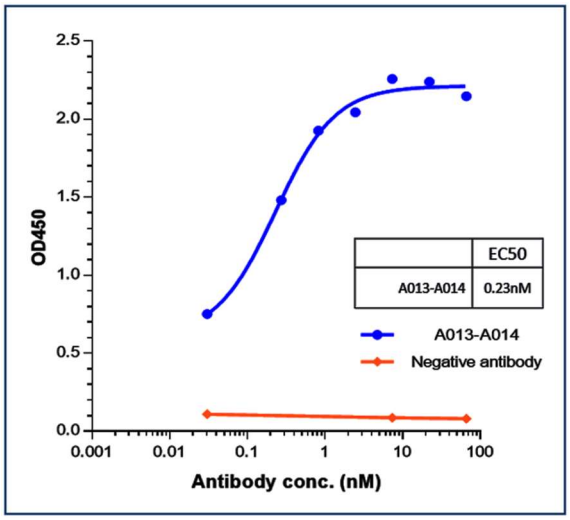


Fig.5 Sandwich-ELISA test antibody RBD-huAb pair mA013 and mA014.

mA013 was coated on 96-well ELISA plate. Spike-RBD protein (nCoV-P007) was added into the well. Then mA014 were added into the well with increasing dilution series, to form the Sandwich structure. Signal was read at OD450.

Result show that mA013 and mA014 form antibody pair.

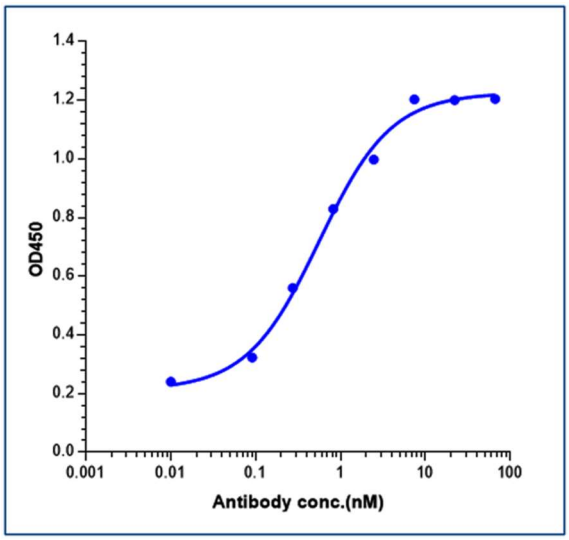


Fig.6 Anti-RBD human antibody (huAb, mA013) binding assay. Tested by ELISA.
Spike-RBD (nCoV-P007) was coated on 96-well ELISA plate. Then an increasing dilution series of anti-RBD huAb (nCoV-mA013) was added into the reaction system.

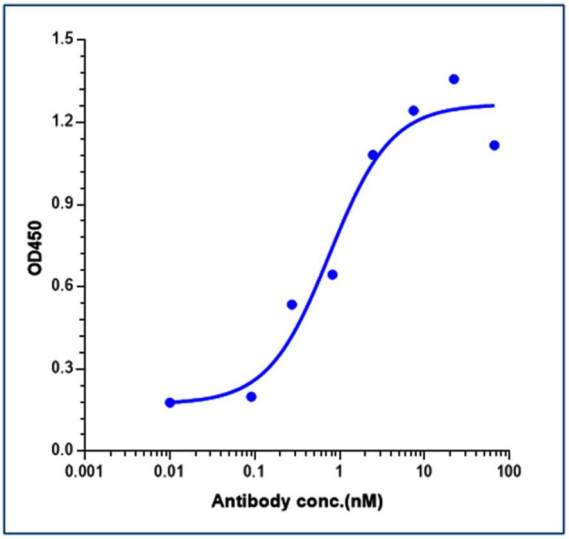


Fig.7 Anti-RBD human antibody (huAb, mA014) binding assay. Tested by ELISA.
Spike-RBD (nCoV-P007) was coated on 96-well ELISA plate. Then an increasing dilution series of anti-RBD huAb (nCoV-mA014) was added into the reaction system.

Spike-Protein S1 subunit (S-protein S1 or S-protein S1f)

Cat. No.	Product name	Tag	Species	Expression Host	Quantity
nCoV-P001	S-protein S1 subunit, fragment (S1f)	N-His	SARS-CoV-2	HEK293T	500μg/1mg
nCoV-p004	S-protein S1 subunit full sequence	C-Fc	SARS-CoV-2	Expi293	100μg/200μg/ 500μg/1mg
nCoV-p005	S-protein S1 subunit full sequence	C-His	SARS-CoV-2	Expi293	100μg/200μg/ 500μg/1mg

nCoV-p001 S1 subunit fragment (S1f) contains the full region of RBD together with part of S1 sequence. It is specially designed for immunological test material. The S1 subunit fragment has been proven by our clients with Immune colloidal gold method and Chemiluminescence platform.
nCoV-p004 and 005 are full sequence of **S1 subunit** which designed for general experiment. It has been tested on flow cytometry, ELISA, Sandwich ELISA and WB platform.

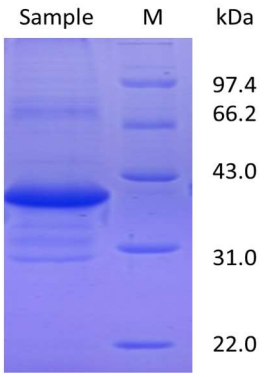
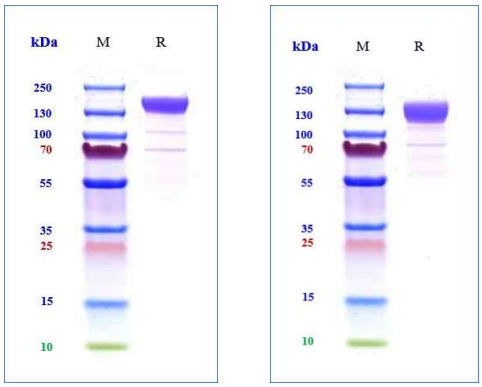


Fig.8 QC result of S-protein S1 subunit fragment (S1f). nCoV-p001.
SDS-PAGE result show the purity >90%. Different batch may be different.



nCoV-p004 S1 Fc **nCoV-p005 S1 His**

Fig.9 QC result of S-protein S1 subunit, Fc tag (nCoV-p004) and His tag (nCoV-p005).
Tris-bis result show the purity >90%. Different batch may be different.

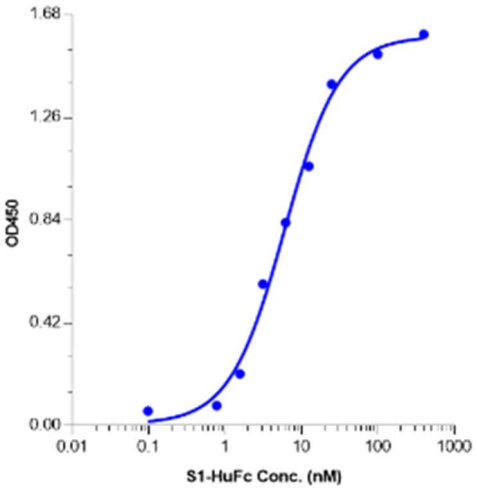


Fig.10 S1 subunit and huACE2 binding assay. Tested by ELISA.
HuACE2 was coated on 96-well ELISA plate. A series dilution of S1 subunit was added into the reaction system. Signal was read at OD450.

Nucleocapsid Protein (N-protein or N-protein-full sequence)

Cat. No.	Product name	Tag	Species	Expression Host	Quantity
nCoV-P003	Nucleocapsid Protein (N-protein), Fragment	N-His	SARS-CoV-2	HEK293T	500μg/1mg
nCoV-p013	N-protein full sequence	His	SARS-CoV-2	Expi293	100μg/200μg/ 500μg/1mg
nCoV-mA006	Anti-Nprotein human mAb (IgG)		human	Affinity: 0.66 nM	100μg/200μg/500μg/1mg
nCoV-mA009	Anti-Nprotein human mAb (IgG)		human	Affinity: 2.7 nM	100μg/200μg/500μg/1mg
nCoV-mA010	Anti-Nprotein human mAb (IgG)		human		100μg/200μg/500μg/1mg
nCoV-mA011	Anti-Nprotein human mAb (IgG)		human		100μg/200μg/500μg/1mg
nCoV-mA017	Anti-Nprotein human mAb (IgG)		human	Affinity: 20.2 pM	100μg/200μg/500μg/1mg
nCoV-mA018	Anti-Nprotein human mAb (IgG)		human	Affinity: 15.6 pM	100μg/200μg/500μg/1mg

nCoV-p003 N-protein fragment is a fragment of the N-protein. It is specially designed for immunological test material. N-protein fragment has been proven by our clients with Immune colloidal gold method and Chemiluminescence platform.
nCoV-p013 is full sequence of N-protein which designed for general experiment. It has been tested on flow cytometry, ELISA, Sandwich ELISA and WB platform.

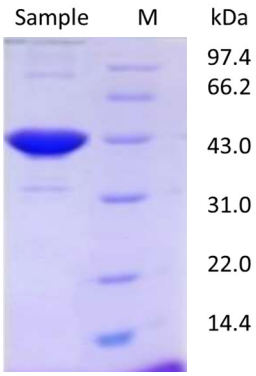


Fig.11 QC result of N-protein fragment (nCoV-p003).
SDS-PAGE result show the purity >90%.
Different batch may be different.

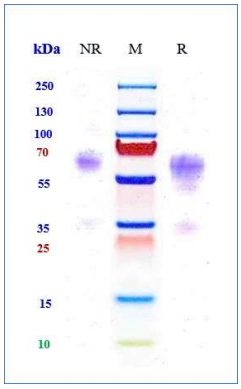


Fig.12 QC result of N-protein full sequence, His tag (nCoV-p013).
Tris-bis result show the purity >90%. Different batch may be different.

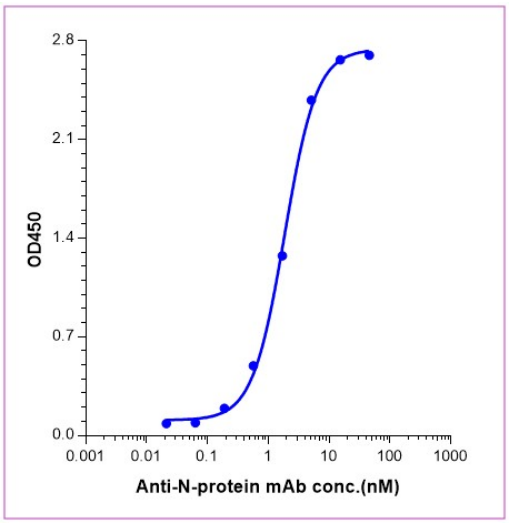


Fig.13 Human anti-N-protein huAb (nCoV-mA006) and N-protein (nCoV-p013) binding assay. Tested by ELISA.
N-protein was coated on 96-well ELISA plate. Then an increasing dilution series of anti-N-protein huAb was added into the reaction system.

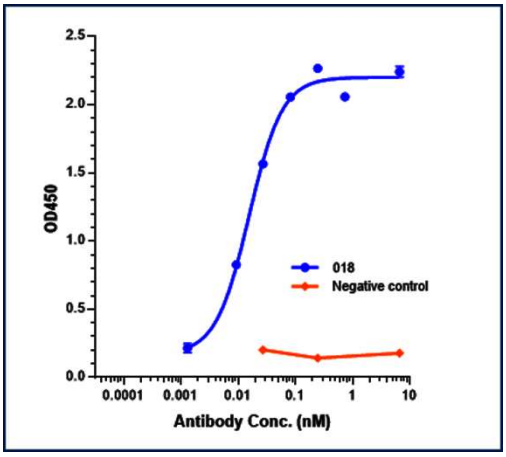


Fig.14 Human anti-N-protein huAb (nCoV-mA017) and N-protein (nCoV-p013) binding assay. Tested by ELISA.
N-protein was coated on 96-well ELISA plate. Then an increasing dilution series of anti-N-protein huAb was added into the reaction system.

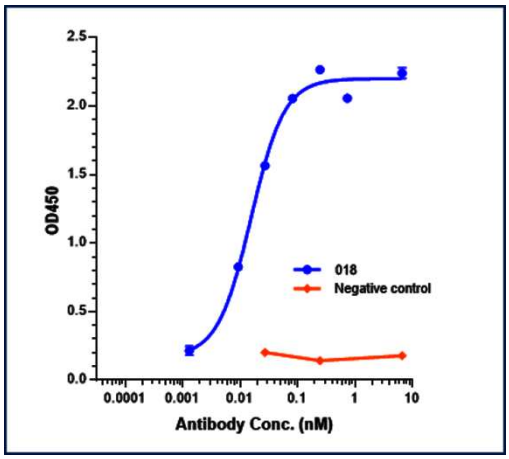


Fig.15 Human anti-N-protein huAb (nCoV-mA018) and N-protein (nCoV-p013) binding assay. Tested by ELISA.
N-protein was coated on 96-well ELISA plate. Then an increasing dilution series of anti-N-protein huAb was added into the reaction system.

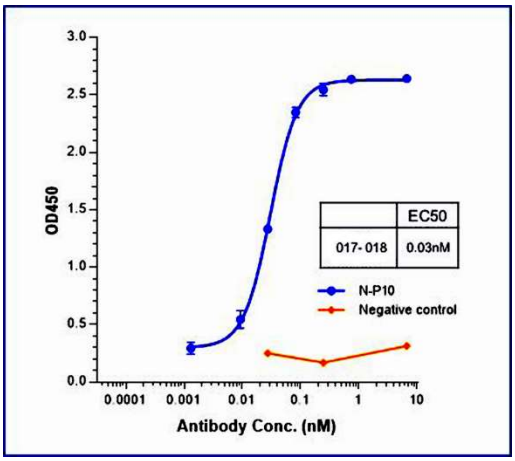
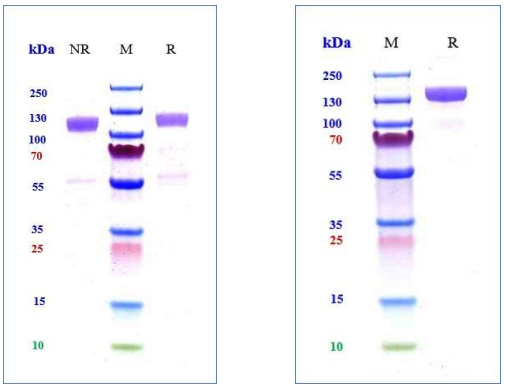


Fig.16 N-protein human mAb competition assay, mA017 and mA018. Tested by ELISA.
mA017 was coated on 96-well plate. Then N-protein (P013) was added to bind with mA017. Afterward, an increasing dilution series of mA018 was added into the reaction system. Signal was read at OD450. Result show that mA017 and mA018 bind to 2 different epitopes on N-protein and the EC50 is 30.4 pM.

Angiotensin-Converting Enzyme 2 (human and mouse, huACE2 and moACE2)

Cat. No.	Product name	Tag	Species	Expression Host	Quantity
nCoV-p009	Human ACE2 Protein	C-Fc	Human	Expi293	100μg/200μg/ 500μg/1mg
nCoV-p010	Human ACE2 Protein	C-His	Human	Expi293	100μg/200μg/ 500μg/1mg
nCoV-p009	Mouse ACE2 Protein	C-Fc	Mouse	Expi293	100μg/200μg/ 500μg/1mg
~~nCoV-p010~~	~~Mouse ACE2 Protein~~	~~C-His~~	~~Mouse~~	~~Expi293~~	~~100μg/200μg/ 500μg/1mg~~
nCoV-mA007	Anti-ACE2 human mAb (IgG)		human		100μg/200μg/500μg/1mg
nCoV-mA012	Anti-ACE2 human mAb (IgG)		human		100μg/200μg/500μg/1mg



huACE2 Fc tag huACE2 Fc tag

Fig.17 Tris-Bis image for human ACE2 his tag and human ACE2 Fc tag, reduced and non-reduced condition.

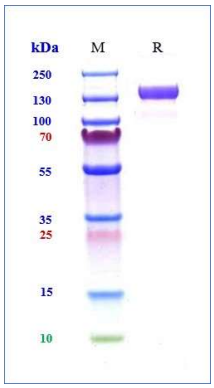


Fig.18 Tris-Bis image for Mouse ACE2 Fc tag, reduced condition.

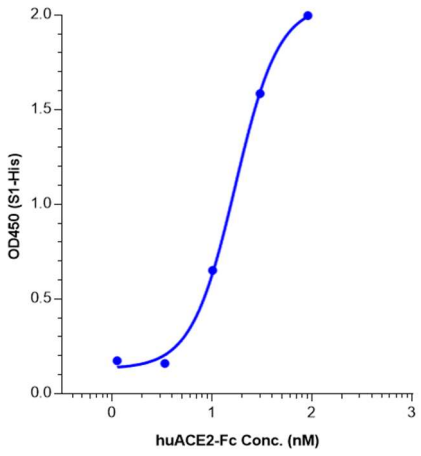


Fig.19 S-protein S1 subunit binding to human ACE2. Tested by ELISA.

S1 subunit is coated on ELISA plate. An increasing concentration series of human ACE2 protein was added to the reaction system. ACE2 antibody was used to detect the bound ACE2.

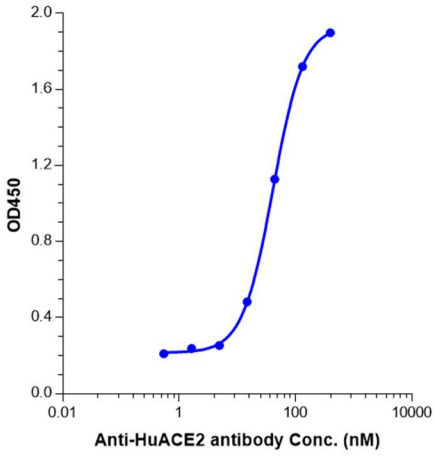


Fig.20 ACE2 huAb and human ACE2 binding assay. Tested by ELISA.

Human ACE2 protein was coated on ELISA plate. An increasing concentration series of human anti HuACE2 was added into the reaction system.

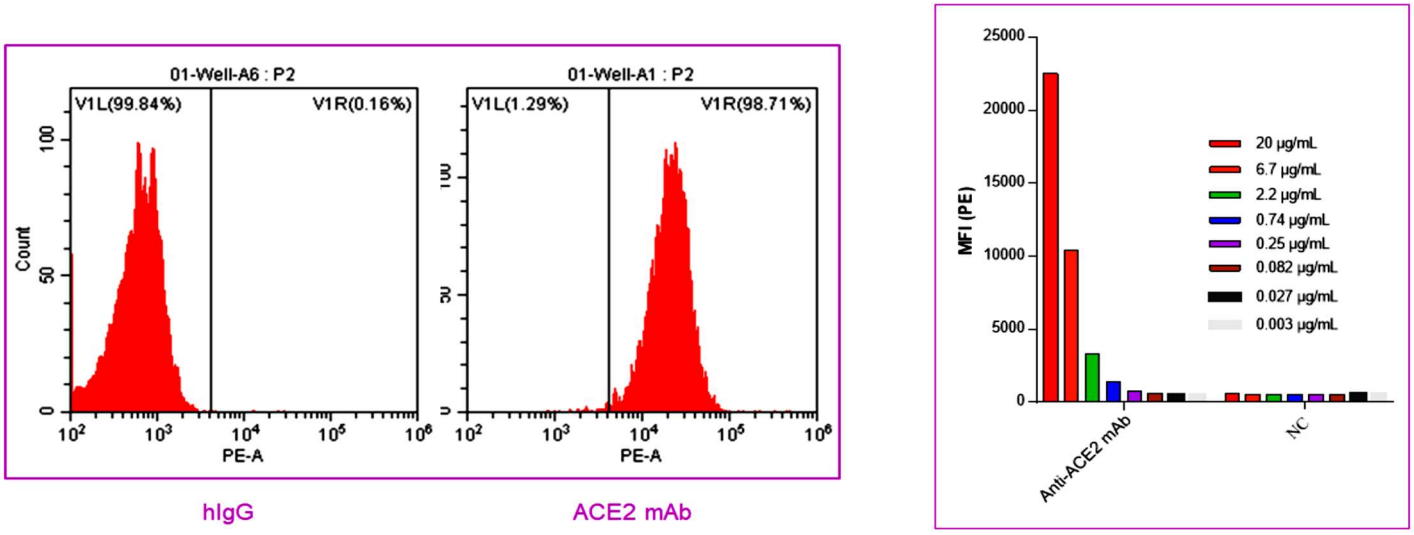


Fig.21 Human anti-huACE2 huAb and huACE2 expressing Vero E6 cell binding assay. Tested by flow cytometry.
HuACE2 expression Vero E6 cell line was developed ahead. An increasing dilution series of human anti-huACE2 huAb was added into the reaction system. Then the signal was read on flow cytometer.

Immunology test material

Cat. No.	Product name	Tag	Species	Expression Host	Quantity
nCoV-P001	Spike Protein S1 subunit, fragment (S-protein)	N-His	SARS-CoV-2	HEK293T	500μg/1mg
nCoV-P003	Nucleocapsid Protein (N-protein), Fragment	N-His	SARS-CoV-2	HEK293T	500μg/1mg
Antibody Pairs					
Antibody Pair: mA001/mA003	Anti-Spike-RBD human mAb (IgG) human		Human		100μg/200μg/500μg/1mg
Antibody Pair: mA004/mA003	Anti-Spike-RBD human mAb (IgG) human		Human		100μg/200μg/500μg/1mg
Antibody Pair: mA017/mA018	Anti-Nprotein human mAb (IgG)		Human		100μg/200μg/500μg/1mg
Antibody Pair: mA013/mA014	Anti-Spike-RBD human mAb (IgG) human		Human		100μg/200μg/500μg/1mg
Antibody Pair: mA021/mA022	Anti-Spike-RBD mouse mAb (IgG) mouse		mouse		1mg

nCoV-p001 S1 subunit fragment contains the full region of RBD together with part of S1 sequence. **nCoV-p003 N-protein fragment** is a fragment of the N-protein. They are specially designed for immunological test material.
These 2 antigens have been proven by our clients with Immune colloidal gold method and Chemiluminescence platform.

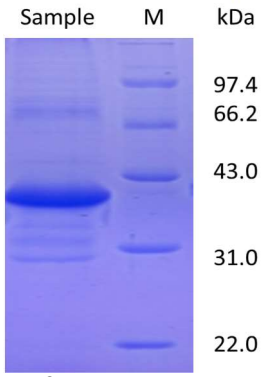


Fig.22 QC result of S-protein S1 subunit fragment (S1f). nCoV-p001.
SDS-PAGE result show the purity >90%. Different batch may be different.

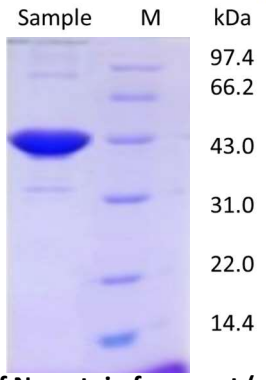
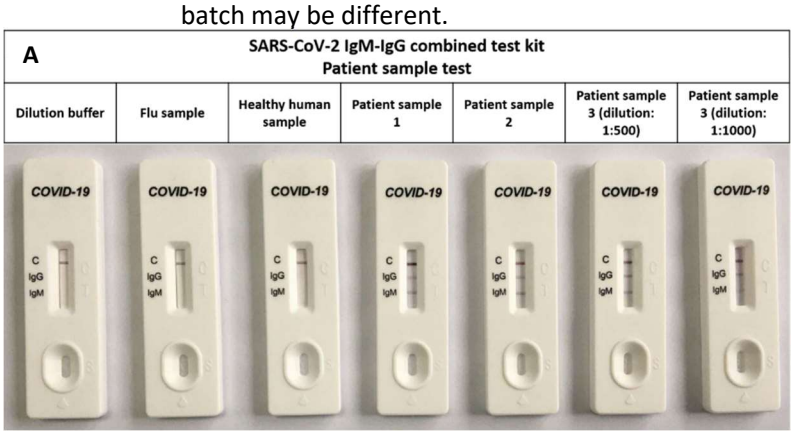
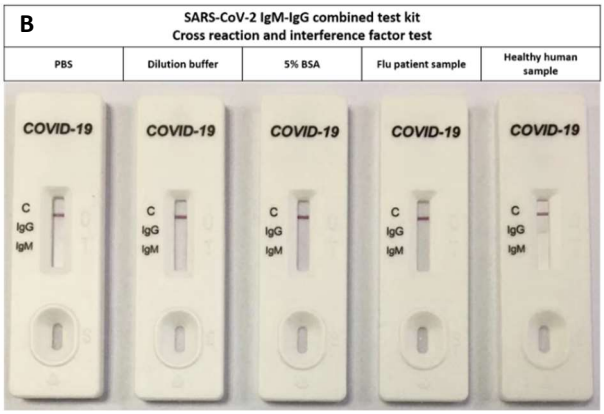


Fig.23 QC result of N-protein fragment (nCoV-p003).
SDS-PAGE result show the purity >90%. Different batch may be different.





Amount of samples	Days post infection	IgM positive	IgG positive	Total positive
10 samples	4 - 10	7 (70%)	2 (20%)	7 (70%)
38 samples	11 - 24	34 (94.4%)	36 (100%)	36 (100%)

Table 1. S-protein S1 subunit fragment and N-protein fragment developed rapid test kit.
A: patient sample test. B: cross reaction and interference test. Form: test result conclusion.

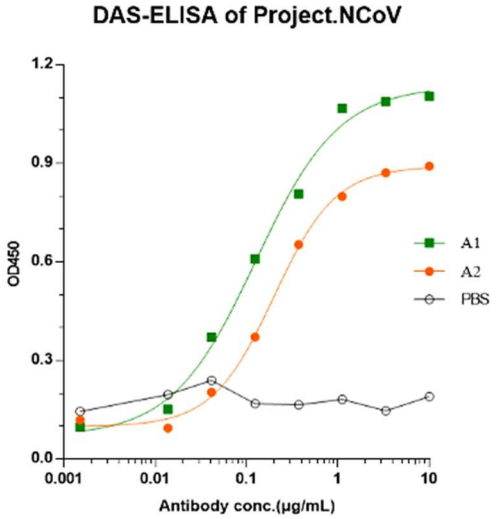


Fig.24 DAS ELISA test antibody pairs among Anti-Spike-RBD human mAb (mA001, mA003 and mA004).
mA003 was coated on 96-well ELISA plate. S1 subunit was added into the well. Then mA001 or mA004 were added into the well to form the Sandwich structure, separately. Signal was read at OD450.
Result show that 2 antibody pairs can be formed: mA001 and mA003; mA003 and mA004.

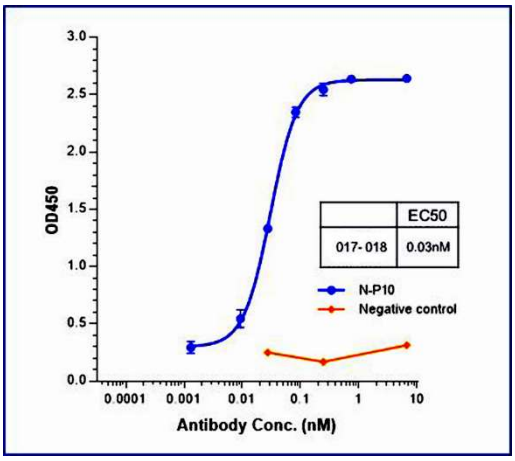


Fig.25 N-protein human mAb competition assay, mA017 and mA018. Tested by ELISA.
mA017 was coated on 96-well plate. Then N-protein (P013) was added to bind with mA017. Afterward, an increasing dilution series of mA018 was added into the reaction system. Signal was read at OD450. Result show that mA017 and mA018 bind to 2 different epitopes on N-protein and the EC50 is 30.4 pM.

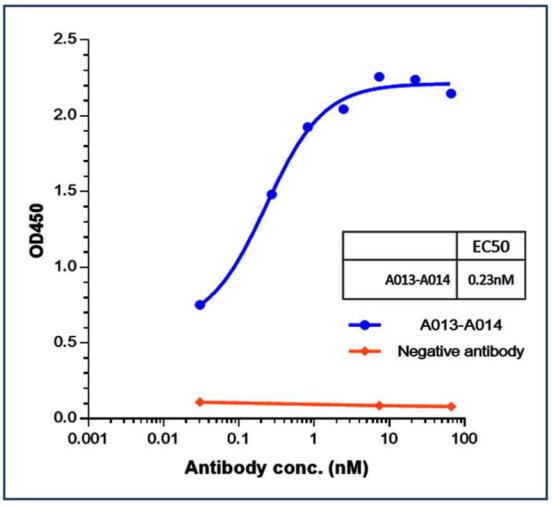
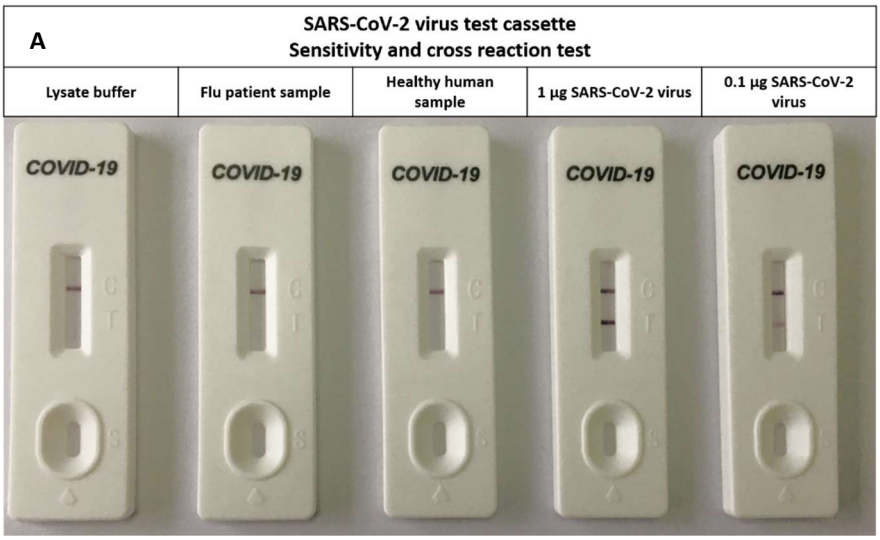


Fig.26 Sandwich-ELISA test antibody RBD-huAb pair mA013 and mA014.
mA013 was coated on 96-well ELISA plate. Spike-RBD protein (nCoV-P007) was added into the well. Then mA014 were added into the well with increasing dilution series, to form the Sandwich structure. Signal was read at OD450.
Result show that mA013 and mA014 form antibody pair.



RT-PCR result	COVID-19 Virus test cassette		Total
	Positive	Negative	
Positive	51	6	57
Negative	0	126	126
Total	51	132	183

Table 2. Anti-Spike-RBD mouse monoclonal antibody pair (IgG, mA021 and mA022) developed test cassette (lateral flow method) result.
A: Sample test. The virus is cultured and diluted in series. After repeated test, the LLD (Low Limit of Detection) is 100pg SARS-CoV-2 virus. Chart: Patient blood sample result.

High expression Spike protein cell line S-Expi293

Product Name	Spike-Expi293 cell line, recombinant Spike-glycoprotein (full sequence, SARS-COV-2).	**Catalog No.**	nCoV-C01
Host Cell and Expression			
Expression type	Secreted expression into intercellular	**Expression Host**	Expi293 cell
Clone ID	6D1	**Mycoplasma**	No (tested by PCR method)
Protein Expression Level	≥35 mg/L	**Yield**	≥14 mg/L
Cell culture	Expi293 medium under common cell culture condition.	**Cell Density**	10^6/vial
Target Protein			
Protein	Spike protein full sequence, SARS-COV-2.	**Uniprot ID**	P0DTC2
Molecular Weight	142 kDa	**Tag**	His tag (If you need to know the location of the tag, please contact us).
Protein purity	≥90% (tested by SDS-PAGE)	**Purification Method**	His tag affinity purification

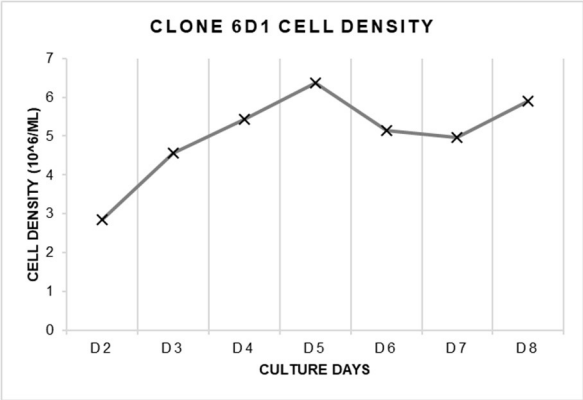


Fig.27 6D1 cell density test during 8 days.
Initial 30mL cell culture with cell density of 2.5×10^6/mL was tested for totally 8 days. Cells was growing to peak density at the 5th day and kept stable till the 8th day.

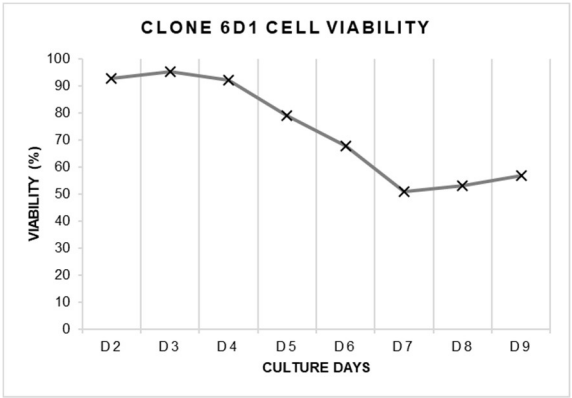


Fig.28 6D1 cell viability test during 8 days.
Initial 30mL cell culture with cell density of 2.5×10^6/mL was tested for totally 8 days. At the 7th day, cell viability dropped to 55% and remained stable till the 8th day.

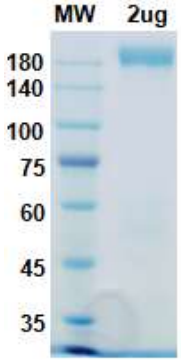


Fig.29 6D1 Spike protein purification.
Culture medium was collected at the 9th day of cell culture and purified by Ni-NTA resin. 2ug of purified protein was loaded to the SDS-PAGE gel. Result show the protein purity was ≥90%; yield is ≥14mg/L.