

**Working with scientists together  
to fight against COVID-19**



Diagnostics

Vaccines

Therapeutics

# **Critical Reagents for SARS-CoV-2 Research**

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## About us

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ACROBiosystems is a leading manufacturer of recombinant proteins and other critical reagents to support the development of target therapeutics, vaccines, and diagnostics.

The company employs an application-oriented development strategy, with a particular focus on product design, quality control, and solution-based support. Our products and services enable anyone in the field of drug development to have a more intuitive and streamlined process.

## Our Customers



Pharma



Biotech



Diagnostics



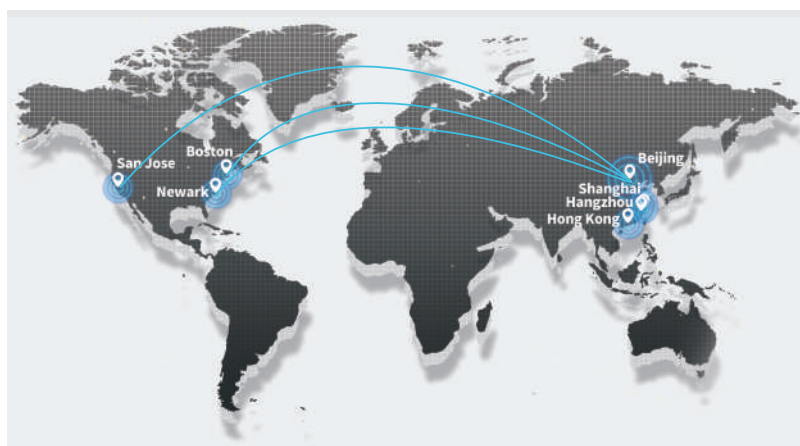
Vaccine



CRO



Academia



> 5,000 Customers

> 60 Countries

> 100,000 Scientists

## Certification

ISO9001  
ISO13485  
CE (Part of products)

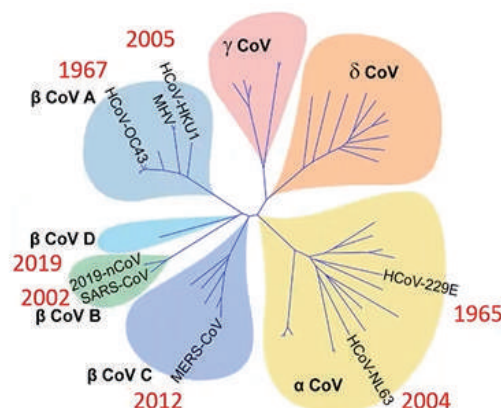




# What do we know about SARS-CoV-2?

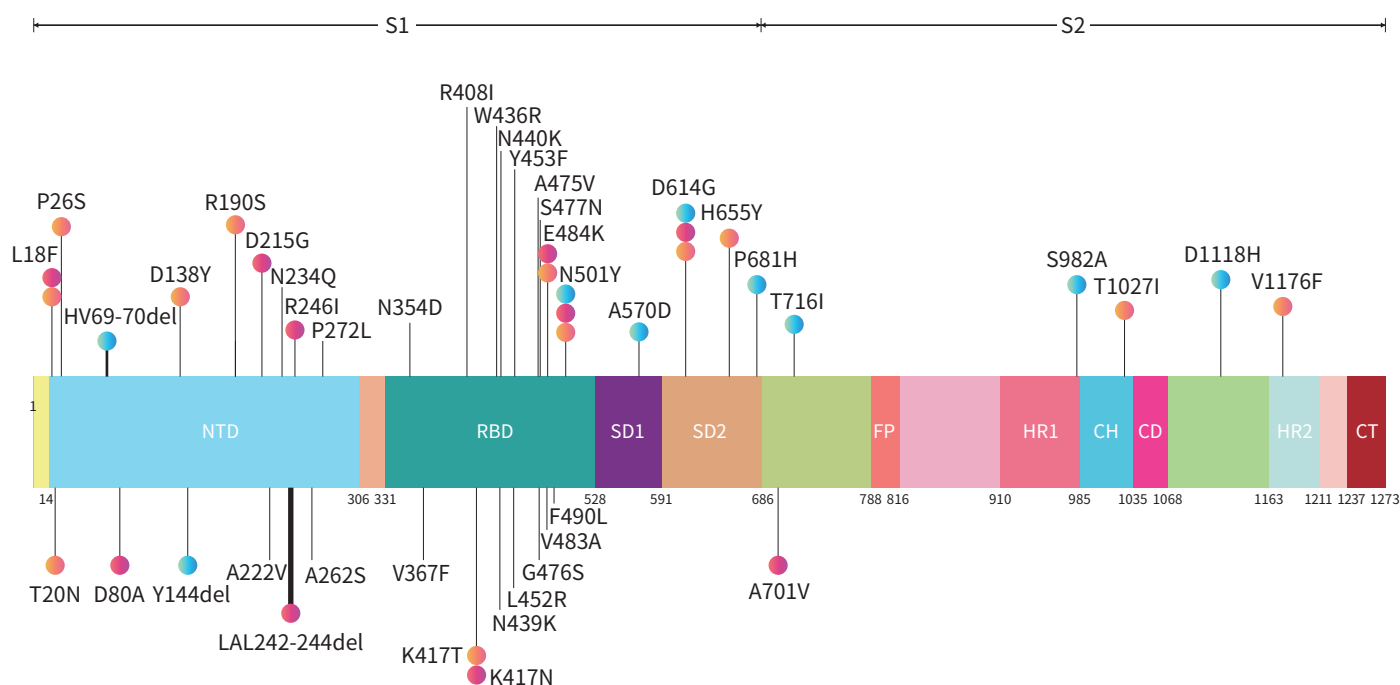


- > The COVID-19 pandemic caused by SARS-CoV-2 is a continuing public health emergency of international concern.
- > The most common symptoms of COVID-19 are fever, fatigue and dry cough. Less common symptoms include aches and pains, running nose, sore throat, loss of the sense of smell and taste, shortness of breath and diarrhea. Some infected people may be asymptomatic.
- > The SARS-CoV-2 virus belongs to a family of coronaviruses, a kind of positive-sense single-stranded RNA virus containing the largest known RNA genomes.
- > Viruses constantly change through mutation, and new variants of a virus are expected to occur over time. Multiple variants of SARS-CoV-2 that causes COVID-19 have been documented globally during this pandemic. Among these are the B.1.1.7 lineage in the UK and the B.1.351 lineage in South Africa, both sharing mutations of concern due to resistance to vaccines and therapeutics.



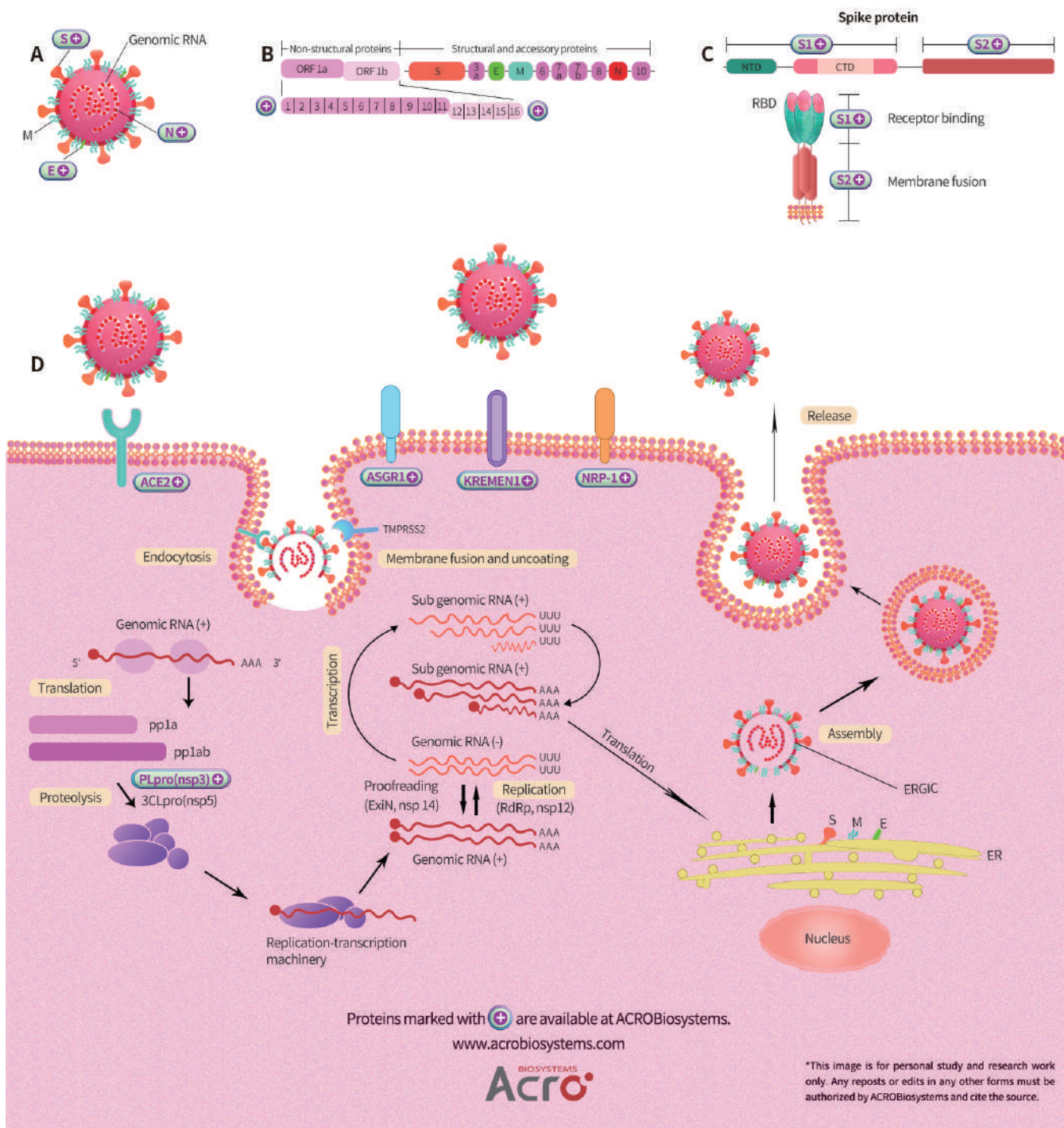
## Popular mutations in spike protein

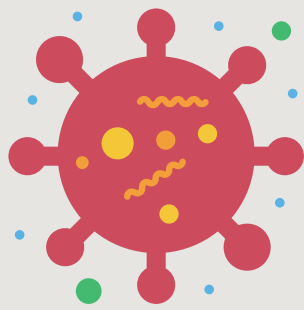
● SA B.1.351 ● UK B.1.1.7 ● Brazil P.1



Check out the product list of mutants from emerging variants on Page 23.

> The Process of How SARS-CoV-2 Infects the Host





## What has ACROBiosystems done?



Scientists have worked tirelessly since the first publication of SARS-CoV-2 sequence at an astounding pace to understand the virus and realizing the hope of ending the pandemic. ACROBiosystems appreciates the critical role that scientists played and their research efforts. We are proud to work alongside the researchers in the fight against COVID-19.

**120+**  
Structural proteins

**10+**  
Non-structural proteins

**70+**  
Mutants

**10+**  
Other coronavirus proteins

**40+**  
Antibodies

**30+**  
Kits

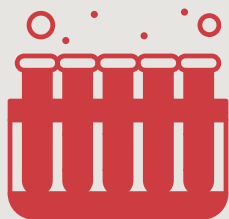
**10+**  
Pre-coupled beads

### Full picture of ACRO's products for fighting against COVID-19

	Pre-exposure/asymptomatic (Screening and prophylaxis)	Symptomatic (Diagnosis and treatment)	post-vaccination (confirmed protection)
Diagnostics	Antigen test		
	Matched antibody pairs (Page 5)		
	IgG/IgM antibody detection		
	S/N proteins (Page 7)		
	Neutralizing antibody detection		
	RBD/ACE2 proteins (Page 7)		
Vaccines	Research&Development	Pre-clinical trial	Clinical trial
	Antigen detection	IgG/IgM antibody detection Neutralizing antibody detection IgG subtype detection	IgG/IgM antibody detection Neutralizing antibody detection
	Antigen titer assay kit (Page 11)	Antibody assay kit (Page 12)	Antibody assay kit (Page 13)
Therapeutics	Research&Development	Pre-clinical trial	Clinical trial
	Immunization, Screening assay, In vitro assay	In vivo assay PK/PD	PK/PD
	Antigens, antibodies, beads and more (Page 14)		

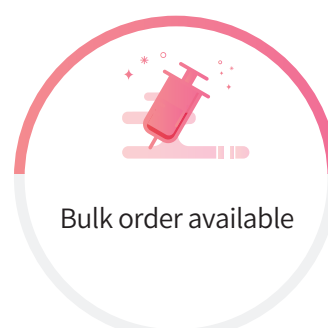
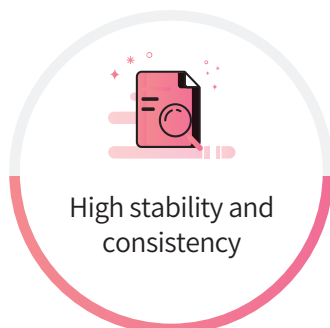
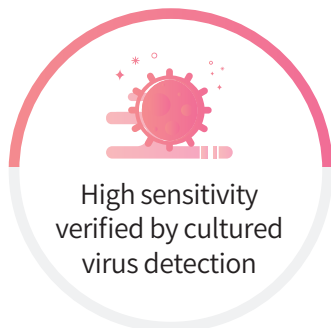
**ACROBiosystems is going full steam ahead on developing more products to support the fight against COVID-19.**  
For the latest product list please visit [www.acrobiosystems.com](http://www.acrobiosystems.com)

# Reagents for Diagnostics Development



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## ■ Reagents for development of antigen test



## ► Popular products

	Cat. No.	Epitope	Isotype	Source	Application
Antibody pair 1	NUN-S91	Nucleocapsid	Mouse IgG1	Mouse	Capture
	NUN-S92	Nucleocapsid	Mouse IgG1	Mouse	Detection
Antibody pair 2	S1N-M13A1	Spike	Human IgG1	Mouse	Capture
	S1N-M12A1	Spike	Human IgG1	Mouse	Detection

## ► Assay data

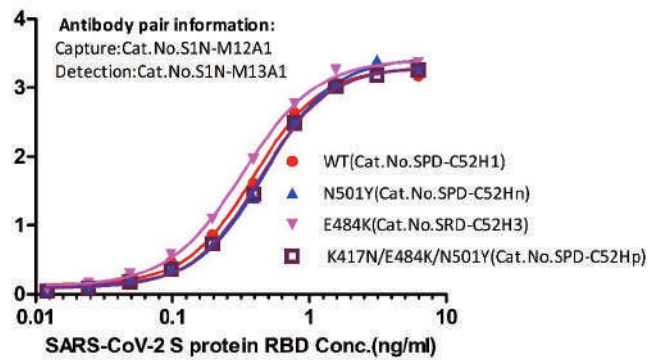
### Verification study using inactivated virus

Titer of inactivated virus	10 <sup>5</sup> TCID <sub>50</sub>	10 <sup>4</sup> TCID <sub>50</sub>	10 <sup>3</sup> TCID <sub>50</sub>	10 <sup>2</sup> TCID <sub>50</sub>	50 TCID <sub>50</sub>	10 TCID <sub>50</sub>	5 TCID <sub>50</sub>
NUN-S91(Capture) NUN-S92(Detection)	+	+	+	+	+	+	-
S1N-M13A1(Capture) S1N-M12A1(Detection)	+	+	+	+	+	-	-

“ Virus lysis buffer  
(Cat.No. LY-13) is  
available for  
antigen detection  
kit development.”

The titer is as low as 5 TCID<sub>50</sub> in the verification study using inactivated virus.

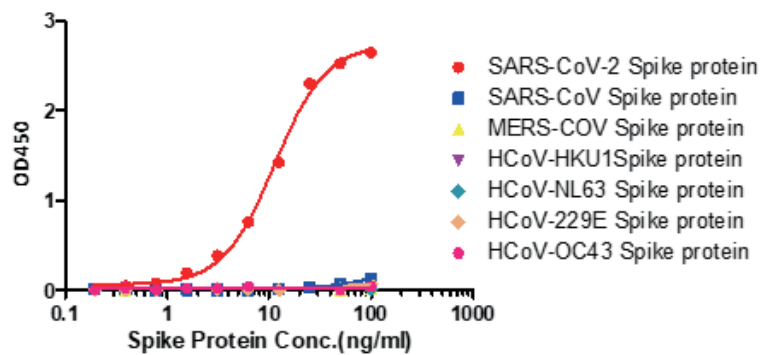
## Detect RBD mutants with high sensitivity



Detection of SARS-CoV-2 S protein RBD mutants (Cat. No. SPD-C52Hn, SRD-C52H3, SPD-C52Hp) by Sandwich ELISA.

## Detect SARS-CoV-2 antigen with high specificity

### Anti-SARS-CoV-2 S1 antibody specificity by sandwich ELISA Assay

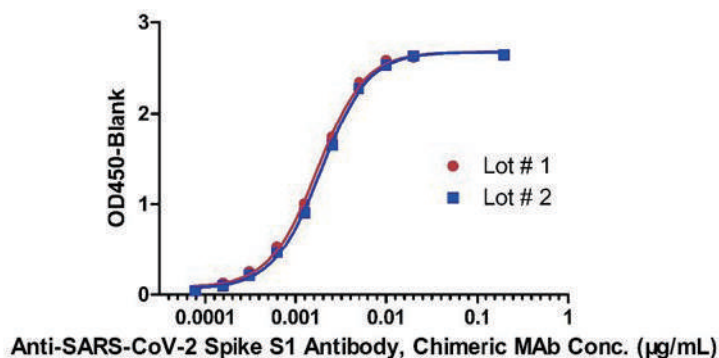


Anti-SARS-CoV-2 S1 antibody specificity by sandwich ELISA Assay.

## High batch-to-batch consistency

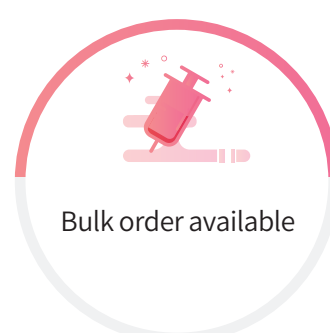
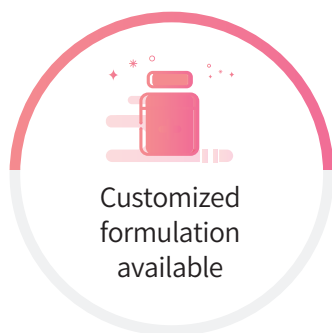
### Anti-SARS-CoV-2 Spike S1 Antibody, Chimeric Mab ELISA

0.2 µg of SARS-CoV-2 S1 protein, His Tag per well



Demonstration of the Batch to Batch Consistency of Anti-SARS-CoV-2 Spike S1 Antibody, Chimeric Mab (Cat. No. S1N-M122) to the S1 protein.

## ■ Reagents for development of antibody test



## ► Popular products

### Reagents for neutralizing antibody detection

Cat. No.	Molecule	Tag	Host
AC2-H5255	ACE2	Fc Tag	HEK293
AC2-H82E7	ACE2	His Tag, Avi Tag	HEK293
SPD-C5255	S protein RBD	Fc Tag	HEK293
SPD-C52M5	S protein RBD	His Tag	HEK293
SPD-C5251	S protein RBD	Mouse IgG2a Fc Tag	HEK293

### Reagents for antibody detection

Cat. No.	Molecule	Tag	Host	Recommended application
SPD-C5251	S protein RBD	Mouse IgG2a Fc Tag	HEK293	Detect total anti-RBD antibodies by double antigen sandwich method (capture)
SPD-C52H1	S protein RBD	His Tag	HEK293	Detect total anti-RBD antibodies by double antigen sandwich method (detection)
SPD-C52Ab	S protein RBD	Mouse IgG2a Fc Tag	HEK293	Detect total anti-RBD antibodies by double antigen sandwich method (Capture)
SPD-C52H2	S protein RBD	His Tag	HEK293	Detect IgG/IgM by capture method
S1N-C82E9	S1 protein	His Tag, Avi Tag	HEK293	Detect anti-S1 IgG/IgM by capture method
NUN-C5221	Nucleocapsid protein	His Tag	HEK293	Detect IgG/IgM by capture method

## Control antibodies

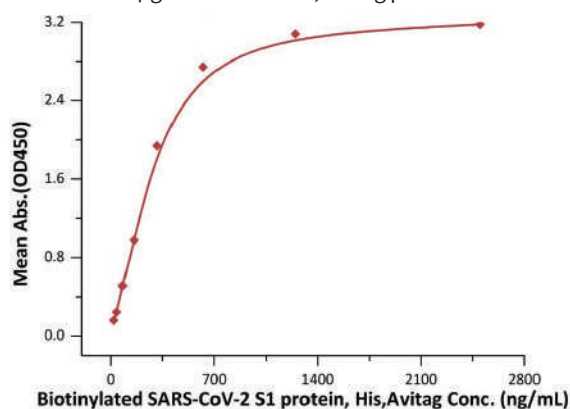
Cat. No.	Product	Application
S1N-M122	Anti-SARS-CoV-2 Spike RBD Neutralizing Antibody, Chimeric mAb, Human IgG1 (AM122)	Positive control
SPD-M180	Anti-SARS-CoV-2 RBD Potent Neutralizing Antibody (AM180)	Positive control
SPD-M128	Anti-SARS-CoV-2 RBD Potent Neutralizing Antibody, Chimeric mAb (AM128)	Positive control
SPD-M141	Anti-SARS-CoV-2 Spike RBD Antibody , Chimeric mAb (AM130)	Positive control

## ► Assay data

### High affinity binding to ACE2

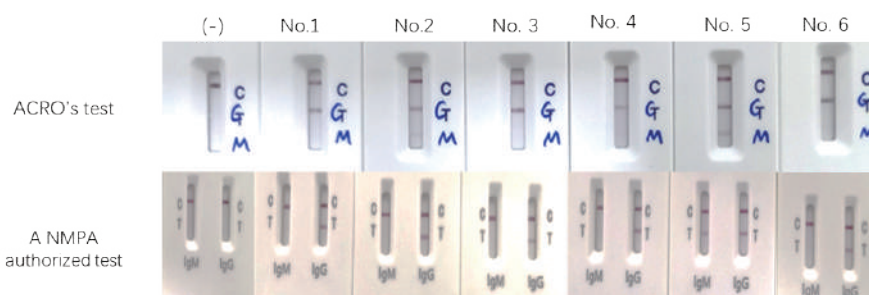
#### Biotinylated SARS-CoV-2 S1 protein, His, Avitag ELISA

0.2 µg of Human ACE2, Fc Tag per well



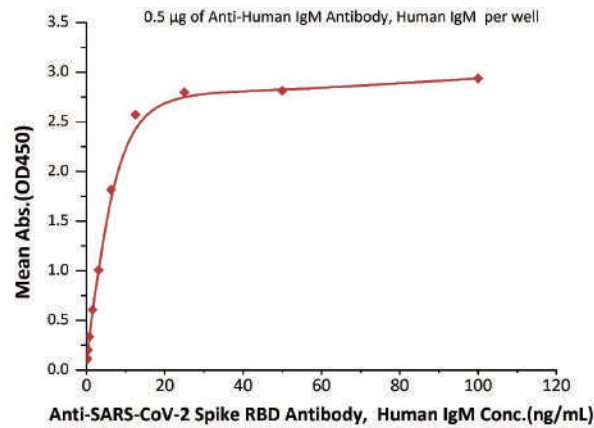
Immobilized Human ACE2, Fc Tag (Cat. No. **AC2-H5257**) at 2 µg/mL (100 µL/well) can bind Biotinylated SARS-CoV-2 S1 protein, His, Avitag (Cat. No. **S1N-C82E9**) with a linear range of 20-312 ng/mL

### Consistent results with a NMPA authorized LFA test



Comparison of ACRO's in-house test with a NMPA authorized LFA test shows the test results are consistent. RBD protein were employed in ACRO's in-house test.

### Anti-SARS-CoV-2 Spike RBD Antibody, Human IgM ELISA



IgM antibody (Cat.No. SPD-M141) was employed as a positive control in ELISA assay.

## ■ Product list for SARS-CoV-2 diagnostic

### ► Antibodies

Cat. No.	Antigen	Source	Isotype	Application
NUN-S91	Nucleocapsid protein	Mouse	Mouse IgG1	Detect N protein by sandwich ELISA
NUN-S92	Nucleocapsid protein	Mouse	Mouse IgG1	
NUN-S46	Nucleocapsid protein	Mouse	Mouse IgG1	
NUN-S47	Nucleocapsid protein	Mouse	Mouse IgG1	
NUN-S57	Nucleocapsid protein	Mouse	Mouse IgG1	
NUN-S60	Nucleocapsid protein	Mouse	Mouse IgG1	
NUN-S61	Nucleocapsid protein	Mouse	Mouse IgG1	
S1N-M12A1	S protein RBD	Mouse	Human IgG1	Detect S protein by sandwich ELISA
S1N-M13A1	S protein RBD	Mouse	Human IgG1	
S1N-S58	S1 protein	Mouse	Mouse IgG1	
S1N-S59	S1 protein	Mouse	Mouse IgG1	

## ► Recombinant Proteins

Cat. No.	Product	Host	Recommended application
AC2-H5255	Human ACE2, Fc Tag	HEK293	Neutralizing antibody detection
AC2-H82E7	Human ACE2, His, Avi Tag	HEK293	Neutralizing antibody detection
SPD-C5251	S protein RBD, mFc Tag	HEK293	Neutralizing antibody detection; Detect total antibodies by double antigen sandwich method (capture)
SPD-C5255	S protein RBD, Fc Tag	HEK293	Neutralizing antibody detection
SPD-C52M5	S protein RBD trimer, His Tag	HEK293	Neutralizing antibody detection
SPD-C52H1	S protein RBD, His Tag	HEK293	Detect total antibodies by double antigen sandwich method (detection)
SPD-C52Ab	S protein RBD, mFc Tag	HEK293	Detect total antibodies by double antigen sandwich method (Capture)
SPD-C52H2	S protein RBD, His Tag	HEK293	Detect IgG/IgM by capture method
SPD-C82E8	S protein RBD, His, Avi Tag	HEK293	Detect IgG/IgM by capture method
SPN-C52H7	S protein trimer, His Tag	HEK293	Detect IgG/IgM by capture method
S1N-C52H2	S1 protein, His Tag	HEK293	Detect IgG/IgM by capture method
S1N-C82E9	S1 protein, His,Avi Tag	HEK293	Detect IgG/IgM by capture method
NUN-C5221	Nucleocapsid protein, His Tag	HEK293	Detect IgG/IgM by capture method
NUN-C51H2	Nucleocapsid protein, His Tag	<i>E.coli</i>	Detect IgG/IgM by capture method
NUN-C81Q8	Nucleocapsid protein, His,Avi Tag	<i>E.coli</i>	Detect IgG/IgM by capture method
ENN-C5128	Envelope Protein, GST,His Tag	HEK293	Detect IgG/IgM by capture method

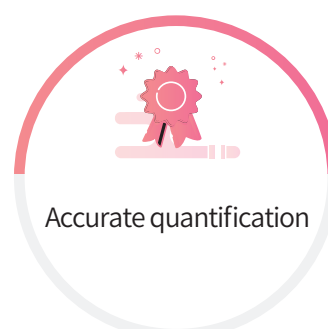
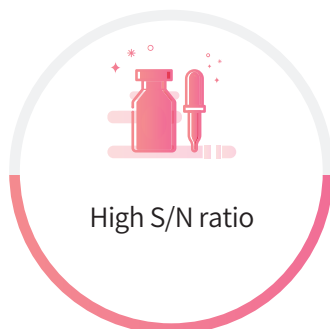
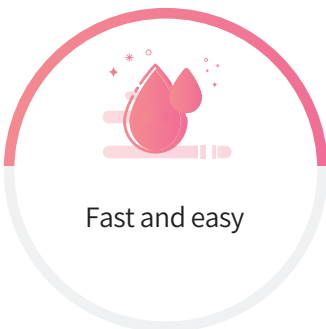
## ► Control antibodies

Cat. No.	Source	Product description	Isotype	Epitope
SPD-M180	Human	Anti-SARS-CoV-2 RBD Potent Neutralizing Antibody (AM180)	Human IgG1	Spike RBD
SAD-S35	Human	Anti-SARS-CoV-2 Spike RBD Neutralizing Antibody (AS35)	Human IgG1	Spike RBD
SPD-M128	Mouse	Anti-SARS-CoV-2 RBD Potent Neutralizing Antibody, Chimeric mAb (AM128)	Human IgG1	Spike RBD
S1N-M122	Mouse	Anti-SARS-CoV-2 Spike RBD Neutralizing Antibody, Chimeric mAb (AM122)	Human IgG1	Spike RBD
S1N-M130	Mouse	Anti-SARS-CoV-2 Spike RBD Antibody, Chimeric mAb (AM130)	Human IgG1	Spike RBD
SPD-M121	Mouse	Anti-SARS-CoV-2 Spike NTD Neutralizing Antibody, Chimeric mAb (AM121)	Human IgG1	S1 protein NTD
SPD-M141	Mouse	Anti-SARS-CoV-2 Spike RBD Antibody, Chimeric mAb (AM130)	Human IgM	Spike RBD
SPD-M162	Mouse	Anti-SARS-CoV-2 Spike RBD Neutralizing Antibody, Chimeric mAb (AM122)	Human IgM	Spike RBD
S2N-S86	Human	Anti-SARS-CoV-2 Spike S2 Antibody (AS86)	Human IgG4	S2 protein



## Tools for vaccines evaluation

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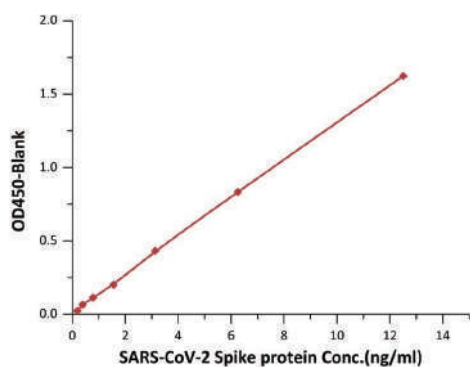
### ■ Research and development

#### ► Popular products (Antigen titer assay kits)

Cat. No.	Product Description	Application
RAS-A010	SARS-CoV-2 Nucleocapsid Protein Titer Assay Kit	Nucleocapsid protein titer detection
RAS-A020	SARS-CoV-2 Spike Protein Titer Assay Kit	Spike protein titer detection
RAS-A021	SARS-CoV-2 Spike RBD Titer Assay Kit	Spike protein RBD titer detection

#### ► Assay data

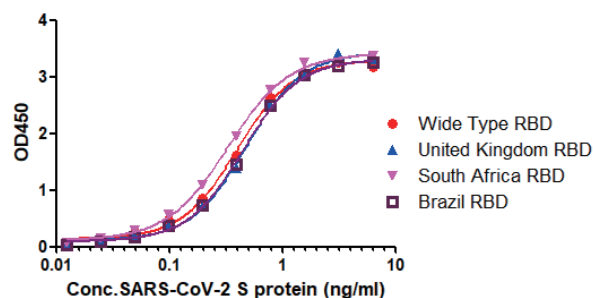
Detect Spike protein with a sensitivity of 200 pg/mL



SARS-CoV-2 Spike Protein Titer Assay Kit (Cat.No. RAS-A020) can detect Spike protein with a sensitivity of 200 pg/mL.

Emerging mutants can be detected by antigen assay kits

Detection Mutant and Wide Type SARS-CoV-2 S Protein RBD by ELISA Kit (Cat.No.RAS-A021)



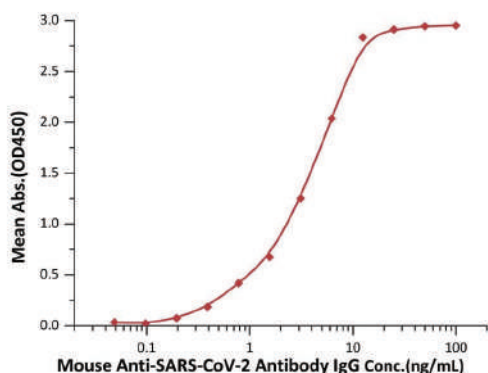
Detection mutant and wide type SARS-CoV-2 S protein RBD by ELISA Kit (Cat.No. RAS-A021)

## ■ Pre-clinical

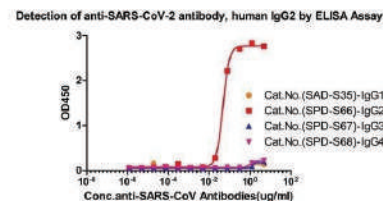
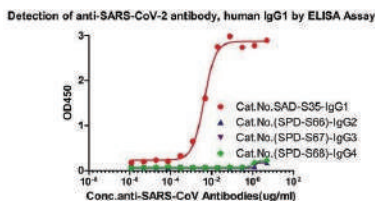
### ► Popular products (Antibody titer assay kits)

Cat. No.	Product Description	Application
RAS-T018	Mouse Anti-SARS-CoV-2 Antibody IgG Titer Serologic Assay kit	Spike RBD protein antibody IgG1 titer detection
RAS-T019	Mouse Anti-SARS-CoV-2 Antibody IgG Titer Serologic Assay kit	Spike RBD protein antibody IgG1 titer detection
TAS-K022	Anti-SARS-CoV-2 Neutralizing Antibody Titer Serologic Assay Kit (CE certified)	Neutralizing antibody titer detection
RAS-N028	Anti-SARS-CoV-2 (B.1.1.7) Neutralizing Antibody Titer Serologic Assay Kit (Spike RBD)	U.K. variant Neutralizing antibody titer detection
RAS-N031	Anti-SARS-CoV-2 (B.1.351) Neutralizing Antibody Titer Serologic Assay Kit (Spike RBD)	South African variant Neutralizing antibody titer detection
RAS-N034	Anti-SARS-CoV-2 (P.1) Neutralizing Antibody Titer Serologic Assay Kit (Spike RBD)	Brazilian variant Neutralizing antibody titer detection
RAS-T014	Anti-SARS-CoV-2 Antibody IgG1 Titer Serologic Assay kit	Spike RBD protein antibody IgG1 titer detection
RAS-T015	Anti-SARS-CoV-2 Antibody IgG2 Titer Serologic Assay kit	Spike RBD protein antibody IgG2 titer detection
RAS-T016	Anti-SARS-CoV-2 Antibody IgG3 Titer Serologic Assay kit	Spike RBD protein antibody IgG3 titer detection
RAS-T017	Anti-SARS-CoV-2 Antibody IgG4 Titer Serologic Assay kit	Spike RBD protein antibody IgG4 titer detection

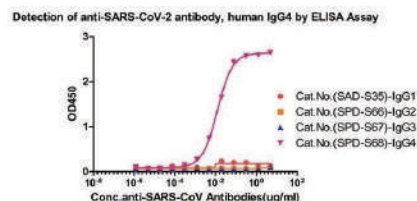
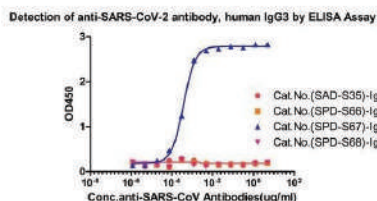
### ► Assay data



Detection of Mouse Anti-SARS-CoV-2 Antibody IgG titer by Indirect-ELISA Assay. Immobilized SARS-CoV-2 Spike RBD at 2 µg/mL (100 µL/well) can bind Mouse Anti-SARS-CoV-2 Antibody IgG in mouse serum. Detection was performed using HRP-Conjugated Anti-mouse IgG secondary antibody with sensitivity of 20 ng/mL.



Cross-validation data for antibody isotype detection

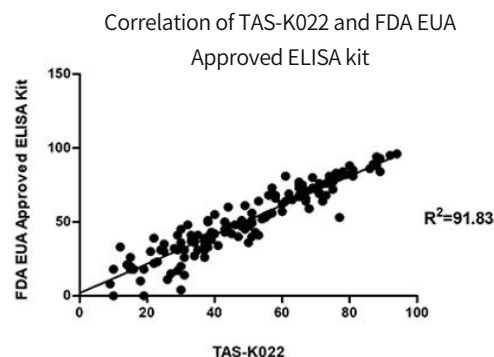


## Clinical trial

### Antibody titer assay kits

Cat. No.	Product Description	Application
TAS-K022	Anti-SARS-CoV-2 Neutralizing Antibody Titer Serologic Assay Kit (CE certified)	Neutralizing antibody titer detection
RAS-N028	Anti-SARS-CoV-2 (B.1.1.7) Neutralizing Antibody Titer Serologic Assay Kit (Spike RBD)	U.K. variant Neutralizing antibody titer detection
RAS-N031	Anti-SARS-CoV-2 (B.1.351) Neutralizing Antibody Titer Serologic Assay Kit (Spike RBD)	South African variant Neutralizing antibody titer detection
RAS-N034	Anti-SARS-CoV-2 (P.1) Neutralizing Antibody Titer Serologic Assay Kit (Spike RBD)	Brazilian variant Neutralizing antibody titer detection
RAS-N036	Anti-SARS-CoV-2 (B.1.1.7) Neutralizing Antibody Serologic Assay Kit (Spike Trimer)	U.K. variant Spike trimer neutralizing antibody titer detection
RAS-N037	Anti-SARS-CoV-2 (B.1.351) Neutralizing Antibody Serologic Assay Kit (Spike Trimer)	South Africa variant Spike trimer neutralizing antibody titer detection
RAS-N038	Anti-SARS-CoV-2 (P.1) Neutralizing Antibody Serologic Assay Kit (Spike Trimer)	Brazilian variant Spike trimer neutralizing antibody titer detection
TAS-K002	Anti-SARS-CoV-2 Antibody IgG Titer Serologic Assay Kit (Spike RBD) (CE certified)	Spike protein RBD antibody IgG titer detection
TAS-K007	Anti-SARS-CoV-2 Antibody IgG Titer Serologic Assay kit (Spike Protein) (CE certified)	S protein trimer antibody IgG titer detection
RAS-T009	Anti-SARS-CoV-2 Total Antibody Titer Serologic Assay kit (Spike RBD)	Spike protein RBD total antibody titer detection
RAS-T012	Anti-SARS-CoV-2 Antibody IgM Titer Serologic Assay Kit (Spike S1)	S1 protein antibody IgM titer detection
RAS-T013	Anti-SARS-CoV-2 Antibody IgM Titer Serologic Assay Kit (Spike RBD)	Spike RBD protein antibody IgM titer detection
RAS-T026	Anti-SARS-CoV-2 (B.1.1.7) Antibody IgG Titer Serologic Assay kit (Spike RBD)	U.K. variant Spike RBD protein antibody IgG titer measurement
RAS-T027	Anti-SARS-CoV-2 (B.1.1.7) Antibody IgG Titer Serologic Assay kit (Spike Protein)	U.K. variant Spike protein antibody IgG titer measurement
RAS-T029	Anti-SARS-CoV-2 (B.1.351) Antibody IgG Titer Serologic Assay kit (Spike RBD)	South African variant Spike RBD protein antibody IgG titer measurement
RAS-T030	Anti-SARS-CoV-2 (B.1.351) Antibody IgG Titer Serologic Assay kit (Spike Protein)	South African variant Spike protein antibody IgG titer measurement
RAS-T032	Anti-SARS-CoV-2 (P.1) Antibody IgG Titer Serologic Assay kit (Spike RBD)	Brazilian variant Spike RBD protein antibody IgG titer measurement
RAS-T033	Anti-SARS-CoV-2 (P.1) Antibody IgG Titer Serologic Assay kit (Spike Protein)	Brazilian variant Spike protein antibody IgG titer measurement

### Assay data

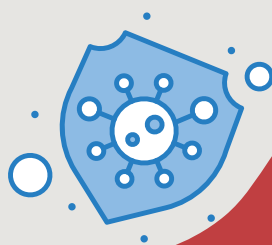


Correlation of **TAS-K022** and FDA EUA approved ELISA kit  
(detecting the serum after the vaccination)

In addition to high throughput ELISA kits, ACROBiosystems also provided high quality antigens and antibodies to support your vaccine assessment assay.

Please check the full product list. (Page 19 )

# Reagents for development of therapeutics



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**Acro**

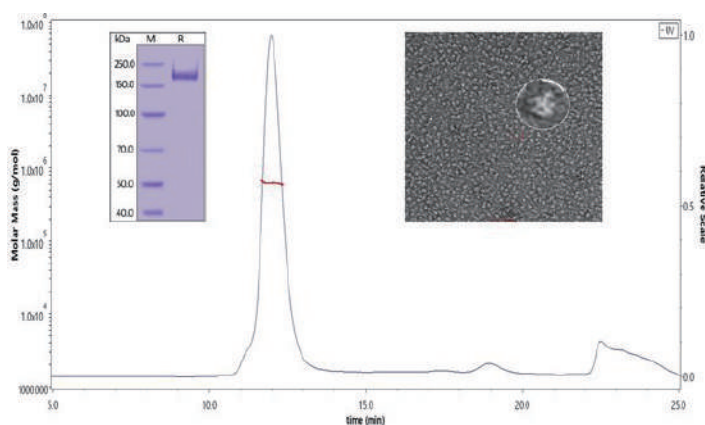
## ■ Featured products

### ► Super stable S trimer

Authentic structural verification by NS-EM

Bioactivity verified by SPR, BLI and ELISA

Good S/N ratio in antibody titer assay



The well-folded trimeric particles of SARS-CoV-2 S protein, His Tag, Super stable trimer (SPN-C52H9) was verified by negative stain electron microscopy. The particles are similar in size and appearance to SARS-CoV-2 trimers reported in published literature.

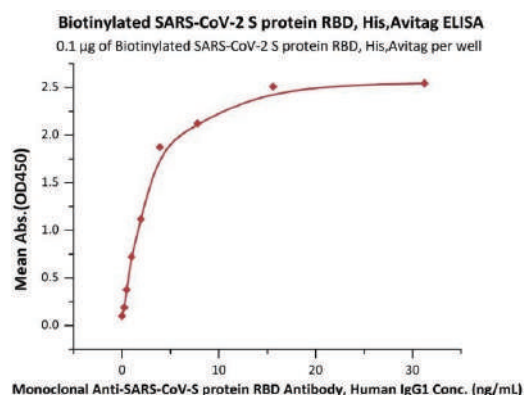
### ► Biotinylated proteins

Featured Avitag™ single-point enzymatic labeling technique

Good bioactivity and detection sensitivity

High batch-to-batch consistency

Immobilized biotinylated SARS-CoV-2 S protein RBD, His,Avitag (Cat. No. SPD-C82E9) at 1 µg/mL (100 µL/well) on Streptavidin (Cat. No. STN-N5116) precoated (0.5 µg/well) plate, can bind monoclonal Anti-SARS-CoV-S protein RBD Antibody, human IgG1 with a linear range of 0.1-4 ng/mL



## ► Case

Pfizer employed ACROBiosystems' biotinylated S protein RBD in the RBD-binding IgG assay during the phase 1/2 mRNA vaccine development. The interim report showed that the biotinylated S protein RBD from ACROBiosystems (Cat.No. [SPD-C82E9](#)) was bound to streptavidin-coated Luminex microspheres.

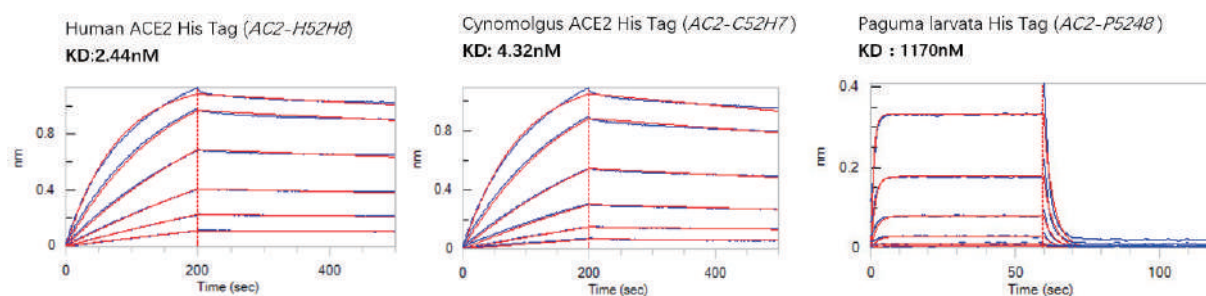
Reference: Mulligan, Mark J et al. Phase I/II study of COVID-19 RNA vaccine BNT162b1 in adults. *Nature*. 2020 Oct;586(7830):589-593.

## ► ACE2 proteins from various species

Allows vaccine and therapeutic assessment in both human and animal models

High purity and batch-to-batch consistency

Good binding bioactivity



BLI binding activity to Spike RBD of different species ACE2 proteins.

## ► Neutralizing antibodies

Potent neutralizing activity

Verified by pseudovirus-based neutralizing assays

High affinity as verified by BLI

### Neutralization assessment of anti-SARS-CoV-2 antibody in pseudo-virus infection assay

	S1N-M122	SPD-M180	SPD-M128
WT-D614G	+++	+++	+
B.1.1.7	+++	+++	+
B.1.351	+++	NA	NA
P.1	+++	NA	NA
B.1.429	+++	NA	+

Comparison of neutralizing ability of different neutralizing antibodies to dominant mutants

## Kd measurement of the interaction of neutralizing antibody and RBD protein mutants(BLI)

Cat. No	Spike protein	AC2- H5257	S1N- M122	SPD- M128	SAD- S35
SPD- C52H3	S protein RBD (Prototype)	2.20E-08	1.07E-09	3.55E-09	1.57E-08
SPD- C52H5	S protein RBD (V483A)	5.28E-09	1.21E-09	1.84E-09	4.57E-09
SPD- C52Hd	S protein RBD (A475V)	1.10E-08	9.39E-10	3.68E-09	6.43E-09
SPD- C52He	S protein RBD (L452R)	2.01E-08	9.37E-10	5.69E-09	1.74E-08
SPD- C52Hf	S protein RBD (F490L)	5.79E-08	2.08E-09	3.69E-08	4.52E-08

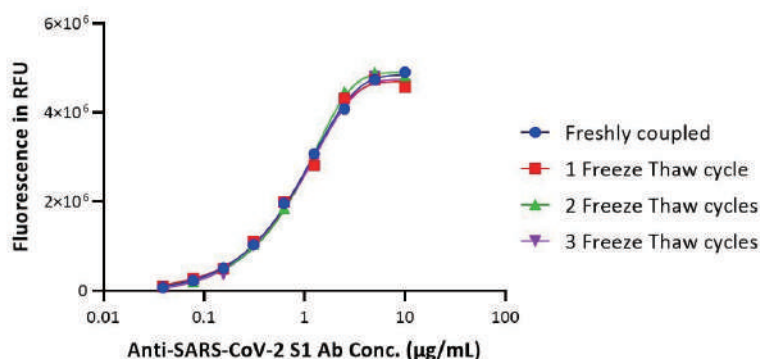
## ► Pre-coupled magnetic beads

Low non-specific binding

High efficiency

Convenient and stable

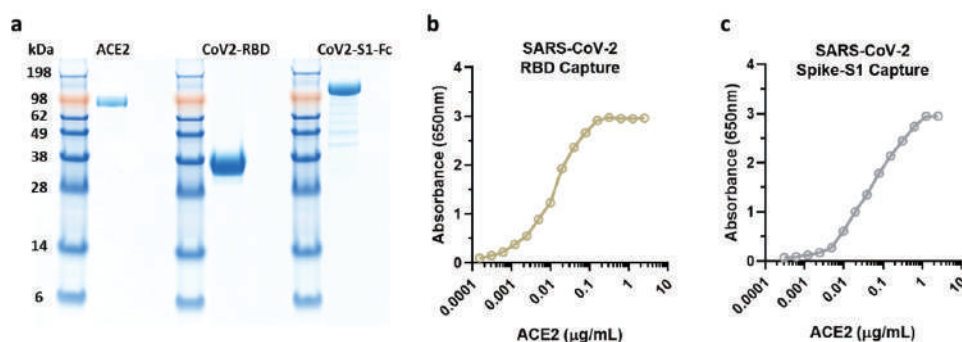
### Binding assay of SARS-CoV-2 beads



Demonstration of high stability of the pre-coupled beads with the performance remaining the same up to 3 freeze-thaw cycles.

## ■ High quality products cited in publications on COVID-19

### ► Case



ACRO protein purity and activity data reported by NIH researchers(Esparza TJ, Martin NP, Anderson GP, Goldman ER, Brody DL. High affinity nanobodies block SARS-CoV-2 spike receptor binding domain interaction with human angiotensin converting enzyme. *Sci Rep.* 2020 Dec 22;10(1):22370. doi: 10.1038/s41598-020-79036-0. PMID: 33353972; PMCID: PMC7755911.)

## ■ Selected publications that cited ACRO's products

**Orthogonal immunoassays for IgG antibodies to SARS-CoV-2 antigens reveal that immune response lasts beyond 4 mo post illness onset**

**Authors:** Sasisekharan, Varun et al.

**Journal:** Proc Natl Acad Sci U S A 2021

**Products cited:** SPD-C52H3 ,NUN-C5227

**Application:** ELISA

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**High affinity nanobodies block SARS-CoV-2 spike receptor binding domain interaction with human angiotensin converting enzyme**

**Authors:** Esparza, Thomas J et al.

**Journal:** Scientific reports 2020

**Products cited:** S1N-C5255,AC2-H52H8,SPD-C52H3,SPD-C52H3,SPD-C82E9,AC2-H82E6,SPD-S52H7,SPD-S52H4

**Application:** Immunization, Competitive Immunopanning, SPR & Binding Assay & Phage Display Clone Screening, BLI, Binding Assay

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**Antibody Signature Induced by SARS-CoV-2 Spike Protein Immunogens in Rabbits**

**Authors:** Ravichandran S, Coyle EM, Klenow L, et al.

**Journal:** Sci Transl Med 2020

**Products cited:** AC2-H52H8

**Application:** SPR

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**Antibody-like proteins that capture and neutralize SARS-CoV-2**

**Authors:** Kondo T, Iwatani Y, Matsuoka K, et al.

**Journal:** Science advances 2020

**Products cited:** S1N-S52H5

**Application:** ELISA

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**Binding of the SARS-CoV-2 Spike Protein to Glycans**

**Authors:** Wei Hao,et al

**Journal:** BioRxiv (preprint) 2020

**Products cited:** S1N-C52H3

**Application:** glycan microarray

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**Cross-neutralization antibodies against SARS-CoV-2 and RBD mutations from convalescent patient antibody libraries**

**Authors:** Yan Lou. et al

**Journal:** BioRxiv (preprint) 2020

**Products cited:** S1N-C52H4,SPD-S52H4,SPD-S52H5,SPD-S52H7,SPD-S52H8

**Application:** BLI,ELISA

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**Deep mutational scanning of SARS-CoV-2 receptor binding domain reveals constraints on folding and ACE2 binding**

**Authors:** Tyler N Starr, Allison J Greaney , Sarah K Hilton, et al.

**Journal:** BioRxiv (preprint) 2020

**Products cited:** AC2-H82E6

**Application:** Flow cytometry

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**Flow-Mediated Susceptibility and Molecular Response of Cerebral Endothelia to SARS-CoV-2 Infection**

**Authors:** Kaneko N, Satta S, Komuro Y, et al.

**Journal:** Stroke 2020

**Products cited:** S1N-C82E8

**Application:** ELISA

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**HDL-scavenger receptor B type 1 facilitates SARS-CoV-2 entry**

**Authors:** Wei C, Wan L, Yan Q, et al.

**Journal:** Nature metabolism 2020

**Products cited:** SPN-C52H9,S1N-C52H3,S2N-C52H5,SPD-C52H3

**Application:** SPR & FACS & Confocal microscopy

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**Human Hematopoietic Stem, Progenitor, and Immune Cells Respond Ex Vivo to SARS-CoV-2 Spike Protein**

**Authors:** Ropa, James et al.

**Journal:** Stem cell reviews and reports 2020

**Products cited:** SPN-C52H8 (This product has been taken off the shelves. An optimized version S1N-C52H9 has been launched.)

**Application:** Colony Forming Unit (CFU)

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**Immune responses to SARS-CoV-2 in three children of parents with symptomatic COVID-19**

**Authors:** Tosif S, Neeland MR, Sutton P, et al.

**Journal:** Nature communications 2020

**Products cited:** S1N-S52H5,S2N-C52H5,S1N-C52H3

**Application:** ELISA\FACS

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## Phase I/II study of COVID-19 RNA vaccine BNT162b1 in adults

**Authors:** Mulligan, Mark J et al.

**Journal:** Nature 2020

**Products cited:** SPD-C82E9

**Application:** Immunogenicity assessments

## SARS-CoV-2 exposure, symptoms and seroprevalence in healthcare workers in Sweden

**Authors:** Rudberg AS, Havervall S, Månberg A, et al.

**Journal:** Nat Commun 2020

**Products cited:** NUN-C5227

**Application:** Luminex

## Successful transfer of anti-SARS-CoV-2 immunity using convalescent plasma in an MM patient with hypogammaglobulinemia and COVID-19

**Authors:** Luetkens T, Metcalf R, Planelles V, et al.

**Journal:** Blood Adv 2020

**Products cited:** S1N-C52H3

**Application:** ELISA



For more informations and request for the full text, please visit [www.acrobiosystems.com](http://www.acrobiosystems.com).

## ■ Full list of products

### ► Neutralizing antibodies

Cat. No.	Source	Product description	Isotype	Epitope
S1N-M122	Mouse	Anti-SARS-CoV-2 Spike RBD Neutralizing Antibody, Chimeric mAb (AM122)	Human IgG1	Spike NTD
SPD-M180	Human	Anti-SARS-CoV-2 RBD Potent Neutralizing Antibody (AM180)	Human IgG1	Spike RBD
SAD-S35	Human	Anti-SARS-CoV-2 Spike RBD Neutralizing Antibody (AS35)	Human IgG1	Spike RBD
SPD-M128	Mouse	Anti-SARS-CoV-2 RBD Potent Neutralizing Antibody, Chimeric mAb (AM128)	Human IgG1	Spike RBD
SPD-M162	Mouse	Anti-SARS-CoV-2 Spike RBD Neutralizing Antibody, Chimeric mAb (AM122)	Human IgM	Spike RBD
SPD-M121	Mouse	Anti-SARS-CoV-2 Spike NTD Neutralizing Antibody, Chimeric mAb (AM121)	Human IgG1	Spike NTD
S1N-VM226	Mouse	Biotinylated Anti-SARS-CoV-2 Spike RBD Neutralizing Antibody, Chimeric mAb, Human IgG1 (AM122)	Human IgG1	Spike RBD

## ► Binding antibodies

Cat. No.	Source	Product description	Isotype	Epitope
SPD-M141	Mouse	Anti-SARS-CoV-2 Spike RBD Antibody, Chimeric mAb (AM130)	Human IgM	Spike RBD
S1N-M130	Mouse	Anti-SARS-CoV-2 Spike RBD Antibody, Chimeric mAb (AM130)	Human IgG1	Spike RBD
S1N-S58A1	Mouse	Anti-SARS-CoV-2 Spike S1 Antibody (AS58)	Mouse IgG1	Spike S1
S1N-S59A1	Mouse	Anti-SARS-CoV-2 Spike S1 Antibody (AS59)	Mouse IgG1	Spike S1
S1N-M164	Mouse	Anti-SARS-CoV-2 Spike RBD Antibody, Chimeric mAb (AM130)	Human IgA1	Spike RBD
S2N-S86	Human	Anti-SARS-CoV-2 Spike S2 Antibody (AS86)	Human IgG4	Spike S2
NUN-S41	Human	Anti-SARS-CoV-2 Nucleocapsid Antibody (AS41)	Human IgG1	Nucleocapsid protein
NUN-S42	Human	Anti-SARS-CoV-2 Nucleocapsid Antibody (AS42)	Human IgG1	Nucleocapsid protein
NUN-S46A1	Mouse	Anti-SARS-CoV-2 Nucleocapsid Antibody (AS46)	Mouse IgG1	Nucleocapsid protein
NUN-S47A1	Mouse	Anti-SARS-CoV-2 Nucleocapsid Antibody (AS47)	Mouse IgG1	Nucleocapsid protein
NUN-S47L8	Mouse	Biotinylated Anti-SARS-CoV-2 Nucleocapsid Antibody (AS47)	Mouse IgG1	Nucleocapsid protein
NUN-S57A1	Mouse	Anti-SARS-CoV-2 Nucleocapsid Antibody (AS57)	Mouse IgG1	Nucleocapsid protein
NUN-S60A1	Mouse	Anti-SARS-CoV-2 Nucleocapsid Antibody (AS60)	Mouse IgG1	Nucleocapsid protein
NUN-S61A1	Mouse	Anti-SARS-CoV-2 Nucleocapsid Antibody (AS61)	Mouse IgG1	Nucleocapsid protein

## ► IgG antibody isotype

Cat. No.	Source	Product description	Isotype	Epitope
SAD-S35	Human	Anti-SARS-CoV-2 Spike RBD Neutralizing Antibody (AS35)	Human IgG1	Spike RBD
SPD-S66	Human	Anti-SARS-CoV-2 Spike RBD Neutralizing Antibody (AS35)	Human IgG2	Spike RBD
SPD-S67	Human	Anti-SARS-CoV-2 Spike RBD Neutralizing Antibody (AS35)	Human IgG3	Spike RBD
SPD-S68	Human	Anti-SARS-CoV-2 Spike RBD Neutralizing Antibody (AS35)	Human IgG4	Spike RBD

## ► HRP-secondary antibody

Cat. No.	Source	Product description	Isotype	Epitope
IG1-S71	Mouse	Anti-Human IgG1 secondary antibody, HRP	Mouse IgG1	Human IgG1
IG2-S72	Mouse	Anti-Human IgG2 secondary antibody, HRP	Mouse IgG1	Human IgG2
IG3-S73	Mouse	Anti-Human IgG3 secondary antibody, HRP	Mouse IgG1	Human IgG3
IG4-S74	Mouse	Anti-Human IgG4 secondary antibody, HRP	Mouse IgG1	Human IgG4

## ► Antibodies for diagnostic

Cat. No.	Source	Product description	Isotype	Epitope
NUN-S91	Mouse	Anti-SARS-CoV-2 Nucleocapsid Antibody, Human IgG1 (AS91) (Trehalose free)	Human IgG1	Nucleocapsid protein
NUN-S92	Mouse	Anti-SARS-CoV-2 Nucleocapsid Antibody, Human IgG1 (AS92) (Trehalose free)	Human IgG1	Nucleocapsid protein
NUN-S46	Mouse	Anti-SARS-CoV-2 Nucleocapsid Antibody (AS46) (Trehalose free)	Mouse IgG1	Nucleocapsid protein
NUN-S47	Mouse	Anti-SARS-CoV-2 Nucleocapsid Antibody (AS47) (Trehalose free)	Mouse IgG1	Nucleocapsid protein
NUN-S57	Mouse	Anti-SARS-CoV-2 Nucleocapsid Antibody (AS57) (Trehalose free)	Mouse IgG1	Nucleocapsid protein
NUN-S60	Mouse	Anti-SARS-CoV-2 Nucleocapsid Antibody (AS60) (Trehalose free)	Mouse IgG1	Nucleocapsid protein
NUN-S61	Mouse	Anti-SARS-CoV-2 Nucleocapsid Antibody (AS61) (Trehalose free)	Mouse IgG1	Nucleocapsid protein
S1N-M12A1	Mouse	Anti-SARS-CoV-2 Spike RBD Neutralizing Antibody, Chimeric mAb (AM122) (Trehalose free)	Human IgG1	Spike RBD
S1N-M13A1	Mouse	Anti-SARS-CoV-2 Spike RBD Antibody, Chimeric mAb (AM130) (Trehalose free) (MALS verified)	Human IgG1	Spike RBD
S1N-S58	Mouse	Anti-SARS-CoV-2 Spike S1 Antibody (AS58) (Trehalose free)	Mouse IgG1	Spike S1
S1N-S59	Mouse	Anti-SARS-CoV-2 Spike S1 Antibody (AS59) (Trehalose free)	Mouse IgG1	Spike S1

## ■ Recombinant Proteins

### ► SARS-CoV-2 proteins

Molecule	Cat.No.	Species	Tag	Host	Product Description
Spike protein	SPN-C52H9	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 S protein, His Tag, Super stable trimer (MALS & NS-EM verified)
	SPN-C82E9	SARS-CoV-2	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 S protein, His,Avitag™, Super stable trimer (MALS verified)

Molecule	Cat.No.	Species	Tag	Host	Product description
Spike RBD	SPD-C5255	SARS-CoV-2	Fc Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD, Fc Tag (MALS verified)
	SPD-C52H3	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD, His Tag (MALS verified)
	SPD-C5259	SARS-CoV-2	Mouse IgG Fc Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD, Mouse IgG2a Fc Tag(MALS verified)
	SPD-C82Aa	SARS-CoV-2	Mouse IgG Fc Tag	HEK293	Biotinylated SARS-CoV-2 (COVID-19) S protein RBD, Mouse IgG1 Fc,Avitag™(MALS verified)
	SPD-C82A9	SARS-CoV-2	Mouse IgG Fc Tag	HEK293	Biotinylated SARS-CoV-2 (COVID-19) S protein RBD, Mouse IgG2a Fc,Avitag™(MALS verified)
	SPD-C82E9	SARS-CoV-2	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 (COVID-19) S protein RBD, His,Avitag™ (MALS verified)
Spike S1	S1N-C52H3	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein, His Tag
	S1N-C52H4	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein, His Tag (MALS verified)
	S1N-C5255	SARS-CoV-2	Fc Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein, Fc Tag
	S1N-C5257	SARS-CoV-2	Mouse IgG Fc Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein, Mouse IgG2a Fc Tag
	S1N-C82E8	SARS-CoV-2	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 (COVID-19) S1 protein, His,Avitag™ (MALS verified)
Spike CTD	S1D-C52H3	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein CTD, His Tag (MALS-verified)
Spike NTD	S1D-C52H6	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein NTD, His Tag
	S1D-C52E2	SARS-CoV-2	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 (COVID-19) S1 protein NTD, His,Avitag™
Spike S2	S2N-C52H5	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S2 protein, His Tag
	S2N-C52E8	SARS-CoV-2	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 (COVID-19) S2 protein, His,Avitag™
Nucleocapsid protein	NUN-C51H9	SARS-CoV-2	His Tag	E.coli	SARS-CoV-2 (COVID-19) Nucleocapsid protein, His Tag
	NUN-C5227	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) Nucleocapsid protein, His Tag
	NUN-C81Q6	SARS-CoV-2	His Tag & Avi Tag	E.coli	Biotinylated SARS-CoV-2 (COVID-19) Nucleocapsid protein, His,Avitag™
	NUN-C82E8	SARS-CoV-2	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 (COVID-19) Nucleocapsid protein, His,Avitag™
	NUN-C5143	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 Nucleocapsid Protein NTD, His Tag (MALS verified)
	NUN-C5145	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 Nucleocapsid Protein CTD, His Tag (MALS verified)
Envelope protein	ENN-C5128	SARS-CoV-2	His Tag & GST Tag	E.coli	SARS-CoV-2 (COVID-19) Envelope protein, GST,His Tag
Papain-like Protease	PAE-C5148	SARS-CoV-2	His Tag	E.coli	SARS-CoV-2 (COVID-19) Papain-like Protease Protein, His Tag
NSP1	NS1-C51H7	SARS-CoV-2	His Tag	E.coli	SARS-CoV-2 (COVID-19) NSP1 Protein, His Tag
NSP16 & NSP10	NS0-C51W3	SARS-CoV-2	His Tag & Strep Tag	E.coli	SARS-CoV-2 (COVID-19) NSP16&NSP10 Heterodimer Protein, His Tag&Twin Strep Tag
NSP7	NS7-C51H6	SARS-CoV-2	His Tag	E.coli	SARS-CoV-2 (COVID-19) NSP7 Protein, His Tag (MALS verified)
NSP7 & NSP8	NS8-C5125	SARS-CoV-2	His Tag	E.coli	SARS-CoV-2 (COVID-19) NSP7&NSP8 Protein, His Tag
NSP8	NS8-C5149	SARS-CoV-2	His Tag	E.coli	SARS-CoV-2 (COVID-19) NSP8 Protein, His Tag

► SARS-CoV-2 protein mutants

Molecule	Cat.No.	Species	Tag	Host	Product Description
Spike protein	SPN-C52H6	SARS-CoV-2 (B.1.1.7)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein (HV69-70del, Y144del, N501Y, A570D, D614G, P681H, T716I, S982A, D1118H), His Tag
	SPN-C82E5	SARS-CoV-2 (B.1.1.7)	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 S protein (HV69-70del, Y144del, N501Y, A570D, D614G, P681H, T716I, S982A, D1118H), His,Avitag™
	SPN-C52H3	SARS-CoV-2 (B.1.1.7/B.1.351/P.1)	His Tag	HEK293	SARS-CoV-2 S protein (D614G), His Tag, Super stable trimer (MALS verified)
	SPN-C82E3	SARS-CoV-2 (B.1.1.7/B.1.351/P.1)	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 S protein (D614G), His, Avitag™, Super stable trimer (MALS verified)
	SPN-C52Hk	SARS-CoV-2 (B.1.351)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein (L18F, D80A, D215G, 242-244del, R246I, K417N, E484K, N501Y, D614G, A701V), His Tag
	SPN-C82E4	SARS-CoV-2 (B.1.351)	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 S protein (L18F, D80A, D215G, 242-244del, R246I, K417N, E484K, N501Y, D614G, A701V), His,Avitag™
	SPN-C52Hg	SARS-CoV-2 (P.1)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein (L18F, T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, D614G, H655Y, T1027I, V1176F), His Tag
	SPN-C82E6	SARS-CoV-2 (P.1)	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 S protein (L18F, T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, D614G, H655Y, T1027I, V1176F), His,Avitag™
	SPN-C52Hd	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 S protein (F817P, A892P, A899P, A942P, K986P, V987P), His Tag
Spike S1	S1N-C52Hd	SARS-CoV-2 (B.1.1.7)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein (HV69-70del), His Tag
	S1N-C52Hc	SARS-CoV-2 (B.1.1.7)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein (Y144del), His Tag
	S1N-C52Hg	SARS-CoV-2 (B.1.1.7/B.1.351/P.1)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein (N501Y), His Tag
	S1N-C52H9	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein (A570D), His Tag
	S1N-C52Hf	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein (E583D), His Tag
	S1N-C5256	SARS-CoV-2 (B.1.1.7/B.1.351/P.1)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein (D614G), His Tag
	S1N-C82E3	SARS-CoV-2 (B.1.1.7/B.1.351/P.1)	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 (COVID-19) S1 protein (D614G), His,Avitag™
	S1N-C52Hb	SARS-CoV-2 (B.1.1.7)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein (P681H), His Tag
	S1N-C52Hn	SARS-CoV-2 (B.1.351/P.1)	His Tag	HEK293	SARS-CoV-2 S1 protein (E484K, D614G), His Tag
	S1N-C52Hp	SARS-CoV-2 (P.1)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein (L18F, T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, D614G, H655Y), His Tag
	S1D-C5253	SARS-CoV-2 (P.1)	Fc Tag	HEK293	SARS-CoV-2 S1 protein (L18F, T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, D614G, H655Y), Fc Tag
	S1N-C52Hm	SARS-CoV-2 (B.1.351)	His Tag	HEK293	SARS-CoV-2 S1 protein (L18F, D80A, D215G, R246I, K417N, E484K, N501Y, D614G), His Tag
	S1D-C5256	SARS-CoV-2 (B.1.351)	Fc Tag	HEK293	SARS-CoV-2 S1 protein (L18F, D80A, D215G, LAL242-244del, R246I, K417N, E484K, N501Y, D614G), Fc Tag
	S1N-C52Hk	SARS-CoV-2 (B.1.1.7)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein (HV69-70del, N501Y, D614G), His Tag
	S1N-C52Hr	SARS-CoV-2 (B.1.1.7)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein (HV69-70del, Y144del, N501Y, A570D, D614G, P681H), His Tag
	S1D-C5254	SARS-CoV-2 (B.1.1.7)	Fc Tag	HEK293	SARS-CoV-2 S1 protein (HV69-70del, Y144del, N501Y, A570D, D614G, P681H), Fc Tag

Molecule	Cat.No.	Species	Tag	Host	Product Description
Spike S1	S1N-C52Hs	SARS-CoV-2 (B.1.427/B.1.429)	His Tag	HEK293	SARS-CoV-2 S1 protein (W152C, L452R, D614G), His Tag
Spike NTD	S1D-C52H8	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein NTD (A222V), His Tag
	S1D-C52H7	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein NTD (N234Q), His Tag
	S1D-C52H5	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein NTD (A262S), His Tag
	S1D-C52H4	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein NTD (P272L), His Tag
	S1D-C52Hd	SARS-CoV-2 (B.1.1.7)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein NTD (HV69-70del, Y144del), His Tag
	S1D-C52Hc	SARS-CoV-2 (B.1.351)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein NTD (L18F, D80A, D215G, 242-244del, R246I), His Tag
	S1D-C52He	SARS-CoV-2 (P.1)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein NTD (L18F, T20N, P26S, D138Y, R190S), His Tag
Spike RBD	SPD-S52H5	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (N354D), His Tag
	SPD-S52H4	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (V367F), His Tag
	SPD-S52H8	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (R408I), His Tag
	SPD-C52Hs	SARS-CoV-2 (B.1.351)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (K417N), His Tag
	SPD-C52Ht	SARS-CoV-2 (P.1)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (K417T), His Tag
	SPD-S52H7	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (W436R), His Tag
	SPD-C52Hg	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (N439K), His Tag
	SRD-C52H2	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (N440K), His Tag
	SPD-C52He	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (L452R), His Tag
	SPD-C52Hk	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (Y453F), His Tag
	SPD-C52Hd	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (G476S), His Tag
	SPD-C52H4	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) NSP7&NSP8 Protein, His Tag
	SPD-C52Hm	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (S477N), His Tag
	SPD-C52H5	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (V483A), His Tag
	SRD-C52H3	SARS-CoV-2 (B.1.351/P.1)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (E484K), His Tag
	SPD-C52Hf	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (F490L), His Tag
	SPD-C82E6	SARS-CoV-2 (B.1.1.7/B.1.351/P.1)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (N501Y), His Tag
	SPD-C52Hn	SARS-CoV-2 (B.1.1.7/B.1.351/P.1)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (N501Y), His Tag
	SPD-C5253	SARS-CoV-2 (B.1.1.7/B.1.351/P.1)	Fc Tag	HEK293	SARS-CoV-2 S protein RBD (N501Y), Fc Tag
	SPD-C52Hp	SARS-CoV-2 (B.1.351)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (K417N, E484K, N501Y), His Tag
	SPD-C5256	SARS-CoV-2 (B.1.351)	Fc Tag	HEK293	SARS-CoV-2 S protein RBD (K417N, E484K, N501Y), Fc Tag
	SPD-C82E5	SARS-CoV-2 (B.1.351)	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 S protein RBD (K417N, E484K, N501Y), His, Avitag™

Molecule	Cat.No.	Species	Tag	Host	Product Description
Spike RBD	SPD-C52Hr	SARS-CoV-2 (P.1)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD (K417T, E484K, N501Y), His Tag
	SPD-C82E7	SARS-CoV-2 (P.1)	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 S protein RBD (K417T, E484K, N501Y), His,Avitag™
	SPD-C5258	SARS-CoV-2 (P.1)	Fc Tag	HEK293	SARS-CoV-2 S protein RBD (K417T,E484K,N501Y), Fc Tag
	SPD-C82E3	SARS-CoV-2 (B.1.427/B.1.429)	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 Spike RBD (L452R), His, Avitag™ (MALS verified)
	SPD-C52Hv	SARS-CoV-2 (B.1.617)	His Tag	HEK293	SARS-CoV-2 Spike RBD (L452R, E484Q), His Tag
	SPD-C82Ec	SARS-CoV-2 (B.1.617)	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 Spike RBD (L452R, E484Q), His,Avitag™
Spike S2	S2N-C52Hc	SARS-CoV-2 (B.1.351)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S2 protein (A701V), His Tag
	S2N-C52Hd	SARS-CoV-2 (B.1.1.7)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S2 protein (T716I, S982A, D1118H), His Tag
	S2N-C52He	SARS-CoV-2 (P.1)	His Tag	HEK293	SARS-CoV-2 (COVID-19) S2 protein (T1027I, V1176F), His Tag
Nucleocapsid protein	NUN-C52Hm	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 Nucleocapsid protein (P13L), His Tag
	NUN-C52Hc	SARS-CoV-2 (P.1)	His Tag	HEK293	SARS-CoV-2 Nucleocapsid protein (P80R), His Tag
	NUN-C52H5	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 Nucleocapsid protein (D103Y), His Tag
	NUN-C52He	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 Nucleocapsid protein (S194L), His Tag
	NUN-C52H6	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 Nucleocapsid protein (S197L), His Tag
	NUN-C52H3	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 Nucleocapsid protein (S202N), His Tag
	NUN-C52Hd	SARS-CoV-2 (B.1.351)	His Tag	HEK293	SARS-CoV-2 Nucleocapsid protein (T205I), His Tag
	NUN-C52H9	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 Nucleocapsid protein (L230F), His Tag
	NUN-C52Hf	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 Nucleocapsid protein (I292T), His Tag
	NUN-C52H4	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 Nucleocapsid protein (Q382H), His Tag
	NUN-C52H8	SARS-CoV-2 (B.1.1.7)	His Tag	HEK293	SARS-CoV-2 Nucleocapsid protein (D3L, R203K, G204R, S235F), His Tag
	NUN-C52Hg	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 Nucleocapsid protein (R203K, G204R), His Tag

## ► Other coronavirus proteins

Molecule	Cat.No.	Species	Tag	Host	Product Description
S protein	SPN-S52H6	SARS	His Tag	HEK293	SARS S protein (R667A, K968P, V969P), His Tag (MALS verified)
	SPN-M52H4	MERS	His Tag	HEK293	MERS Spike protein trimer (R748A, R751A, V1060P, L1061P), His Tag (MALS verified)
	SPN-H52H3	HCoV-229E	His Tag	HEK293	HCoV-229E Spike Trimer, His Tag
	SPN-H52H4	HCoV-NL63	His Tag	HEK293	HCoV-NL63 Spike Trimer, His Tag
	SPN-H52H5	HCoV-HKU1	His Tag	HEK293	HCoV-HKU1 (isolate N5) Spike Trimer, His Tag
	SPN-H52H6	HCoV-OC43	His Tag	HEK293	HCoV-OC43 Spike Trimer, His Tag

Molecule	Cat.No.	Species	Tag	Host	Product Description
S1 protein	S1N-S52H5	SARS	His Tag	HEK293	SARS S1 protein, His Tag (MALS verified)
	S1N-M52H5	MERS	His Tag	HEK293	MERS S1 protein, His Tag
	SIN-V52H4	HCoV-229E	His Tag	HEK293	HCoV-229E S1 protein, His Tag
	SIN-V52H6	HCoV-HKU1 (isolate N5)	His Tag	HEK293	HCoV-HKU1(isolate N5) S1 protein, His Tag
	SIN-V52H3	HCoV-NL63	His Tag	HEK293	HCoV-NL63 S1 protein, His Tag
S protein RBD	SPD-S52H6	SARS	His Tag	HEK293	SARS S protein RBD, His Tag (MALS verified)
	SPD-M52H6	MERS	His Tag	HEK293	MERS S protein RBD, His Tag
Nucleocapsid protein	NUN-S5229	SARS	His Tag	HEK293	SARS Nucleocapsid protein, His Tag
	NUN-M52H5	MERS	His Tag	HEK293	MERS Nucleocapsid protein, His Tag
	NUN-V5147	HCoV-229E	His Tag	E.coli	HCoV-229E Nucleocapsid protein, His Tag
	NUN-V5146	HCoV-NL63	His Tag	E.coli	HCoV-NL63 Nucleocapsid protein, His Tag
	NUN-V5145	HCoV-OC43	His Tag	E.coli	HCoV-OC43 Nucleocapsid protein, His Tag

## ► Host receptor proteins

Molecule	Cat.No.	Species	Tag	Host	Product Description
ACE2	AC2-H82E6	Human	His Tag & Avi Tag	HEK293	Biotinylated Human ACE2 / ACEH Protein, His, Avitag™ (MALS verified)
	AC2-H5257	Human	Fc Tag	HEK293	Human ACE2 / ACEH Protein, Fc Tag (MALS verified)
	AC2-H82F9	Human	Fc Tag & Avi Tag	HEK293	Biotinylated Human ACE2 / ACEH Protein, Fc,Avitag™
	AC2-H52H8	Human	His Tag	HEK293	Human ACE2 / ACEH Protein, His Tag (MALS verified)
	AC2-H5205	Human	Mouse IgG1 Fc Tag	HEK293	Human ACE2 / ACEH Protein, Mouse IgG1 Fc Tag (MALS verified)
	AC2-H82E8	Human	His Tag & Avi Tag	HEK293	Biotinylated Human ACE2 / ACEH Protein, His, Avitag™
	AC2-P5248	Paguma larvata	His Tag	HEK293	Paguma larvata ACE2 / ACEH Protein, His Tag (SPR verified)
	AC2-M5248	Mouse	His Tag	HEK293	Mouse ACE2 / ACEH Protein, His Tag (MALS verified)
	AC2-C52H7	Cynomolgus	His Tag	HEK293	Cynomolgus ACE2 / ACEH Protein, His Tag
	AC2-R5246	Rat	His Tag	HEK293	Rat ACE2 / ACEH Protein, His Tag (MALS verified)
Neuropilin-1	NR1-H5228	Human	His Tag	HEK293	Human Neuropilin-1 / NRP1 / CD304 Protein, His Tag
	NR1-H5252	Human	Fc Tag	HEK293	Human Neuropilin-1 / NRP1 / CD304 Protein, Fc Tag
	NR1-H82E3	Human	His Tag & Avi Tag	HEK293	Biotinylated Human Neuropilin-1 / NRP1 / CD304 Protein, His,Avitag™
	NR1-M5254	Mouse	Mouse IgG2a Fc Tag	HEK293	Mouse Neuropilin-1 / NRP1 / CD304 Protein, Mouse IgG2a Fc Tag, low endotoxin
ASGR1	AS1-H5253	Human	Fc Tag	HEK293	Human ASGR1/ASGPR1 Protein, Fc Tag
KREMEN1	KR1-H5253	Human	Fc Tag	HEK293	Human Kremen-1 protein, Fc Tag

## ► Antigens for diagnostics

Molecule	Cat.No.	Species	Tag	Host	Product Description
S1 protein	S1N-C82E9	SARS-CoV-2	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 (COVID-19) S1 protein, His,Avitag™ (MALS verified)
	S1N-C52H2	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S1 protein, His Tag
S protein RBD	SPD-C82E8	SARS-CoV-2	His Tag & Avi Tag	HEK293	Biotinylated SARS-CoV-2 (COVID-19) S protein RBD, His,Avitag™ (MALS verified)
	SPD-C52H1	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD, His Tag
	SPD-C52H2	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD, His Tag
	SPD-C5251	SARS-CoV-2	Mouse Fc Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD, Mouse IgG2a Fc Tag
	SPD-C5255	SARS-CoV-2	Fc Tag	HEK293	SARS-CoV-2 (COVID-19) S protein RBD, Fc Tag (MALS verified)
	SPD-C52M5	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 S protein RBD trimer, His Tag (MALS verified)
S protein	SPN-C52H7	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 S protein, His Tag, Super stable trimer (MALS verified)
Nucleocapsid protein	NUN-C51H2	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) Nucleocapsid protein, His Tag
	NUN-C5221	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) Nucleocapsid protein, His Tag
S2 protein	S2N-C52H2	SARS-CoV-2	His Tag	HEK293	SARS-CoV-2 (COVID-19) S2 protein, His Tag

## ■ Kits

### ► Antibody titer assay kits

Cat.No.	Product Description
TAS-K022	Anti-SARS-CoV-2 neutralizing antibody titer serologic assay kit (CE certified)
TAS-K002	Anti-SARS-CoV-2 Antibody IgG Titer Serologic Assay kit (Spike protein RBD) (CE certified)
TAS-K007	Anti-SARS-CoV-2 Antibody IgG Titer Serologic Assay kit (S protein trimer) (CE certified)
RAS-T001	Anti-SARS-CoV-2 Antibody IgG Titer Serologic Assay kit (Spike protein S1)
RAS-T008	Anti-SARS-CoV-2 Antibody IgG Titer Serologic Assay kit (Nucleocapsid Protein)
RAS-T009	Anti-SARS-CoV-2 Total Antibody Titer Serologic Assay kit (Spike protein RBD)
RAS-T012	Anti-SARS-CoV-2 Antibody IgM Serologic Assay kit (S1 protein)
RAS-T013	Anti-SARS-CoV-2 Antibody IgM Serologic Assay kit (Spike RBD protein)
RAS-T014	Anti-SARS-CoV-2 antibody IgG1 Serologic Assay kit
RAS-T015	Anti-SARS-CoV-2 antibody IgG2 Serologic Assay kit
RAS-T016	Anti-SARS-CoV-2 antibody IgG3 Serologic Assay kit
RAS-T017	Anti-SARS-CoV-2 antibody IgG4 Serologic Assay kit

Cat.No.	Product Description
RAS-T018	Mouse Anti-SARS-CoV-2 antibody IgG Serologic Assay kit
RAS-T019	Monkey Anti-SARS-CoV-2 antibody IgG Serologic Assay kit
RAS-T026	Anti-SARS-CoV-2 (B.1.1.7) Antibody IgG Titer Serologic Assay kit (Spike RBD)
RAS-T027	Anti-SARS-CoV-2 (B.1.1.7) Antibody IgG Titer Serologic Assay kit (Spike protein)
RAS-N028	Anti-SARS-CoV-2 (B.1.1.7) Neutralizing Antibody Titer Serologic Assay Kit (Spike RBD)
RAS-T029	Anti-SARS-CoV-2 (B.1.351) Antibody IgG Titer Serologic Assay kit (Spike RBD)
RAS-T030	Anti-SARS-CoV-2 (B.1.351) Antibody IgG Titer Serologic Assay kit (Spike protein)
RAS-N031	Anti-SARS-CoV-2 (B.1.351) Neutralizing Antibody Titer Serologic Assay Kit (Spike RBD)
RAS-T032	Anti-SARS-CoV-2 (P.1) Antibody IgG Titer Serologic Assay kit (Spike RBD)
RAS-T033	Anti-SARS-CoV-2 (P.1) Antibody IgG Titer Serologic Assay kit (Spike protein)
RAS-N034	Anti-SARS-CoV-2 (P.1) Neutralizing Antibody Titer Serologic Assay Kit (Spike RBD)
RAS-N036	Anti-SARS-CoV-2 (B.1.1.7) Neutralizing Antibody Serologic Assay Kit (Spike Trimer)
RAS-N037	Anti-SARS-CoV-2 (B.1.351) Neutralizing Antibody Serologic Assay Kit (Spike Trimer)
RAS-N038	Anti-SARS-CoV-2 (P.1) Neutralizing Antibody Serologic Assay Kit (Spike Trimer)

### ► Antigen titer assay kits

Cat.No.	Product Description
RAS-A010	SARS-CoV-2 Nucleocapsid Protein Titer Assay Kit
RAS-A020	SARS-CoV-2 Spike Protein Titer Assay Kit
RAS-A021	SARS-CoV-2 Spike protein RBD Titer Assay Kit

### ► Inhibitor screening kits and more

Cat.No.	Product Description
EP-105	SARS-CoV-2 (COVID-19) Inhibitor screening Kit
SP-12	SARS-CoV-2 Spike S1 protein-Coated Plates, Clear, 96-Well
RP-13	SARS-CoV-2 Spike protein RBD-Coated Plates, Clear, 96-Well

## ■ Beads

### ► Magnetic beads

Cat.No.	Product Description	Application
MBS-K001	SARS-CoV-2 Spike S1-coupled Magnetic Beads	S1 protein antibody screening
MBS-K002	SARS-CoV-2 Spike RBD-coupled Magnetic Beads	Spike protein RBD antibody screening
MBS-K013	Human ACE2-coupled Magnetic Beads	Virus capture
MBS-K014	Human Anti-SARS-CoV-2 Spike RBD Antibody-coupled Magnetic Beads	Virus capture
MBS-K015	SARS-CoV-2 Spike Trimer-coupled Magnetic Beads	Spike protein trimer antibody screening
MBS-K016	SARS-CoV-2 Spike Trimer (D614G)-coupled Magnetic Beads	Spike protein trimer(D614G) antibody screening
MBS-K017	SARS-CoV-2 Nucleocapsid Protein-coupled Magnetic Beads	Nucleocapsid protein antibody screening
MBS-K018	SARS-CoV-2 Spike S2-coupled Magnetic Beads	Spike S2 antibody screening
MBS-K019	SARS-CoV-2 Spike NTD-coupled Magnetic Beads	Spike NTD antibody screening
MBS-K029	SARS-CoV-2 (B.1.1.7) Spike Trimer-coupled Magnetic Beads	Variant antibody screening
MBS-K030	SARS-CoV-2 (B.1.351) Spike Trimer-coupled Magnetic Beads	Variant antibody screening
MBS-K031	SARS-CoV-2 (P.1) Spike Trimer-coupled Magnetic Beads	Variant antibody screening
MBS-K032	SARS-CoV-2 (B.1.351) Spike RBD-coupled Magnetic Beads	Variant antibody screening
MBS-K033	SARS-CoV-2 (P.1) Spike RBD-coupled Magnetic Beads	Variant antibody screening
MBS-K034	SARS-CoV-2 (B.1.1.7) Spike RBD-coupled Magnetic Beads	Variant antibody screening

Her2 BAFFR LAG-3  
 Fc Receptor Siglec-10  
 Biotinylated Protein  
 PD-L1 VEGF165 CD3 epsilon  
 ACE2 PD-1 BCMA  
 CD27 PVRIG  
 CD47 PSMA  
 FGL1 TFPI  
 Siglec-15 Integrin  
 CD24 S protein RBD Spike  
 S trimer FcRn PCSK9  
 CD3 epsilon Nucleocapsid  
 CAR-T Target Protein  
 Glypican 3 Integrin MICA PD-1  
 FcRn ADA Service CD30 MICA  
 EGF R B7-H3 BCMA CD3E & CD3G  
 Integrin TIGIT TGF-beta 1  
 4-1BB Siglec-15  
 Biotinylated Protein  
 CD20 CD200 GTR Nectin-4  
 VEGF165 CD73 FGLI  
 PCSK9 IgG1 Fc CD40 CD69 Nectin-4  
 SIRP alpha ADA Service PD-L1  
 Nectin-4 Biotinylated Protein CD3E & CD3D PSMA  
 SPR /BLI analytical service IL-2