Sino Biological

Featured Recombinant Proteins

The Global Leader in Recombinant Technology

- Immune Checkpoint Proteins
- Cytokines
- Biotherapeutic Targets
- Viral Antigens
- Recombinant Production Service

About Sino Biological

Sino Biological specializes in recombinant protein and antibody development production. All of Sino Biological's products are independently developed and produced. Sino Biological offers pharmaceutical companies and biotechnology firms a variety of recombinant production and assay services for pre-clinical research development work. The company's ever-growing portfolio of products includes recombinant proteins, monoclonal antibodies, ELISA assay kits, expression clones, cell culture media, and other molecular biology tools. In addition, Sino Biological is dedicated to virology and infectious disease research. Its ProVir™ collection is the world's largest viral antigen bank, carrying over 800 products from 350 strains of viruses.

Featured Recombinant Proteins

- Immune Checkpoint Proteins
- Cytokines
- Biotherapeutic Targets
- Viral Antigens

Capacity & Capability

6000+

Recombinant Proteins in Stock

1000+

New Proteins R&D Capability per Year

2L-1000L

80+ Bioreactors Ranging from 2 L to 1000 L

0.1mg-1kg

Recombinant Production Amount

CiteAb Awards

Supplier with the largest percentage increase in protein reagent citations during the previous year.

Supplier that has reacted quickly to the events of 2020 and has achieved success with products related to COVID-19.

Strict Quality Control

ISO9001

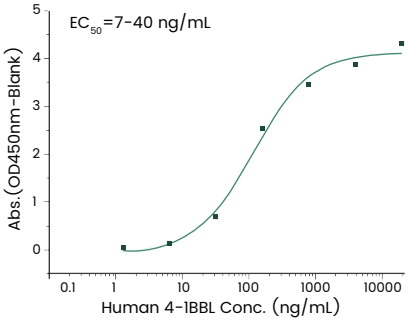
CNAS

ISO13485

Immune Checkpoint Proteins

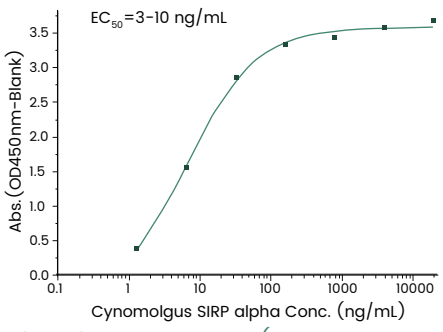
There are two families of immune checkpoints, co-stimulatory and co-inhibitory family, which are involved in regulating TCR recognition in the process of immune response. CTLA4 and PD1 are two of the most studied immune checkpoint receptors, and the corresponding antibodies can enhance the anti-tumor immunity. Immune checkpoints have the greatest potential use in tumor immunotherapy. Sino biological has developed high bioactivity immune checkpoint proteins from multiple species.

Human 4-1BBL (Cat#: 15693-H01H)



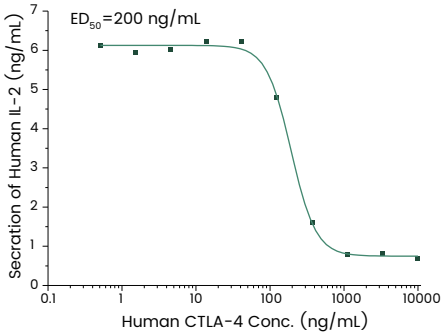
Bind with Human CD137 (Cat#: 10041-H08H)

Cynomolgus SIRP alpha (Cat#: 90931-C08H)



Bind with Human CD47 (Cat#: 10359-H02H)

Human CTLA4 (Cat#: 11159-H08H)



Inhibit IL-2 secretion

Co-inhibitory Immune Checkpoint Proteins (Partial)

PD-1	PD-L1	CTLA-4	VISTA	PD-L2	B7-1
H: 10377-H03H M: 50124-M03H R: 80448-R08H Ca: 70109-D02H Cy: 90311-C02H Rh: 90305-R08H	H: 10084-H08H M: 50010-M03H R: 80450-R02H Ca: 70110-D02H Cy/Rh: 90251-C08H	H: 11159-H31H5 M: 50503-M02H R: 81069-R08H Ca: 70113-D02H Cy/Rh: 90213-C08H	H: 13482-H02H M: 51550-M08H R: 81347-R02H Cy: 90844-C02H Rh: 90801-K08H	H: 10292-H08H M: 50804-M02H R: 80454-R08H Cy: 90249-C02H	H: 10698-H03H M: 50446-M02H R: 80027-R02H Cy: 90268-C02H

SIRP alpha	B7-H3	B7-H4	LAG3	CD47	CD86
H: 11612-H27H-B M: 50956-M02H R: 80270-R08H Cy: 90931-C08H	H: 11188-H27H-B M: 50973-M02H R: 80380-R08H Cy: 90806-C02H	H: 10738-H27H-B M: 50017-M02H R: 80170-R08H Cy/Rh: 90901-C08H	H: 16498-H05H M: 53069-M08H R: 80367-R08H Cy: 90841-C08H	H: 12283-H27H-B M: 57231-M31H R: 80305-R08H Cy: 90869-C02H	H: 10699-H03H M: 50068-M08H R: 80025-R08H Cy/Rh: 90270-C08H

TIGIT	NECTIN2	CD155	CEACAM1	NECTIN1	TIM-3
H: 10917-H02H M: 50939-M38H R: 8A6318-R02H Cy: 90890-C02H	H: 10005-H02H M: 50318-M08H R: 80327-R08H Cy: 90206-C08H	H: 10109-H27H-B M: 50259-M41H-B R: 80007-R08H Rh: 90005-C08H	H: 10822-H03H M: 50571-M02H R: 80224-R08H	H: 11611-H02H M: 58137-M08H R: 80244-R08H	H: 10390-H08H M: 51152-M02H Cy: 90312-C02H

PVRIG	H: 28312-H02H1 Cy/Rh: 90971-C08H	CD96	H: 11202-H08H M: 50758-M08H	Nectin 3	H: 10852-H08H

Note: H-Human, M-Mouse, R-Rat, Ca-Canine, Cy-Cynomolgus, Rh-Rhesus

Products' Citations (Partial)

Molecule	Title	Journal	Year
B7-H3	B7-H3 promotes colorectal cancer angiogenesis through activating the NF-κB pathway to induce VEGFA expression	Cell Death & Disease	2020
PD-1	PD-L1:CD80 Cis-Heterodimer Triggers the Co-stimulatory Receptor CD28 While Repressing the Inhibitory PD-1 and CTLA-4 Pathways	Immunity	2019
PD-1	An engineered oncolytic virus expressing PD-L1 inhibitors activates tumor neoantigen-specific T cell responses	Nat Commun	2020
CTLA-4	DNA-based delivery of checkpoint inhibitors in muscle and tumor enables long-term responses with distinct exposure	Molecular Therapy	2020

Co-stimulatory Immune Checkpoint Proteins (Partial)

CD40	CD40 Ligand	CD28	B7-1	CD86	GITR
H: 10774-H03H M: 50324-M08H R: 80151-R02H Ca: 70105-D02H Rh: 90097-C08H	H: 10239-H42H-B M: 50327-M01H R: 80177-R01H Ca: 70068-D04H Rh: 90096-C01H	H: 11524-H41H-B M: 50103-M03H R: 80302-R02H Cy: 90182-C02H Cy/Rh: 90182-C08H	H: 10698-H03H M: 50446-M02H R: 80027-R02H Cy: 90268-C02H	H: 10699-H03H M: 50068-M08H R: 80025-R08H Cy/Rh: 90270-C08H	H: 13643-H08H M: 57511-M05H R: 80192-R02H Cy: 90871-C08H

CD27	CD155	ICOS	ICOS Ligand	CD137	TNFSF9
H: 10039-H03H M: 50110-M08H R: 80223-R02H Rh: 90049-C02H	H: 10109-H27H-B M: 50259-M41H-B R: 80007-R08H Rh: 90005-C08H	H: 10344-H03H M: 50466-M41H-B R: 80381-R02H Rh: 90866-C02H	H: 11559-H08H M: 50190-M03H R: 81346-R02H Cy: 90800-C08H	H: 10041-H03H M: 5A7656-M08H Ca: 70095-D08H Rh: 90847-K02H	H: 15693-H42H-B M: 50067-M07H R: 80166-R01H Cy: 90848-C01H

OX40	NECTIN2	CD226	CD70	OX40L	HVEM
H: 10481-H03H M: 50808-M31H R: 84472-R02H Rh: 90846-C08H	H: 10005-H02H M: 50318-M08H R: 80327-R08H Cy: 90206-C08H	H: 10565-H03H M: 50232-M08H R: 80369-R02H	H: 10780-H42H-B M: 51129-M04H R: 80161-R01H	H: 13127-H04H M: 53582-M08H1 Cy: 90088-C04H	H: 10334-H08H M: 10567-M03H Cy: 90109-C02H

LIGHT	H: 10386-H01H M: 50980-M07B	TNFSF18	H: 16080-H07B	HHLA2	H: 16139-H02H

Note: H-Human, M-Mouse, R-Rat, Ca-Canine, Cy-Cynomolgus, Rh-Rhesus

Products' Citations (Partial)

Molecule	Title	Journal	Year
CD27	Development of homogeneous plasmonic potency assay using gold nanoparticle immunocomplexes	J Pharm Biomed Anal	2020
CD40	CD40 Enhances Type I Interferon Responses Downstream of CD47 Blockade, Bridging Innate and Adaptive Immunity	Cancer Immunol Res	2019
CD137	CD137 ligand feedback upregulates PD-L1 expression on lung cancer via T cell production of IFN-γ	Thorac Cancer	2019
CD27	Development of homogeneous plasmonic potency assay using gold nanoparticle immunocomplexes	J Pharm Biomed Anal	2020

Other Immune Checkpoint Target Proteins (Partial)

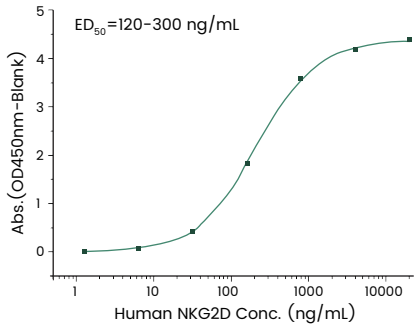
CEACAM3	CEACAM5	CEACAM6	CD66b	LILRA1	LILRA2
LILRA4	LILRA5	LILRA6	LILRB1	ILT4	LILRB3
LILRB5	CD150	CD48	CD229	CD244	CD84
SLAMF7	LAIR1	LAIR2	SIGLEC5	CD22	CD33
SIGLEC15	BTN3A1	BTN3A3	HMGB1	RAGE	BTLA
LILRA3	SIGLEC6	KIR3DL3	KIR2DL1	KIR2DL3	KIR2DL4
ILT3	KIR2DL5	CD160	TMIGD2	DR3	SIGLEC10
SLAMF6					

NKG2A, NKG2D and Ligands

NKG2A, NKG2D belong to the NKG2 family. The activation of NKG2D by its ligands, including MICA, MICB, and ULBPs, is an important anti-tumor signaling axis.

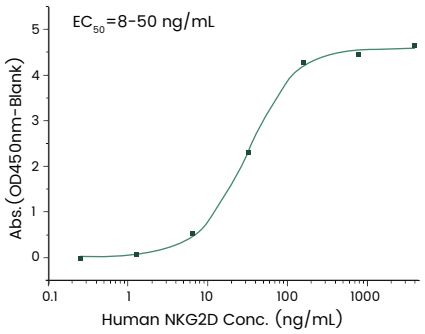
Binding Activity Validated By ELISA Assay

Human NKG2D (Cat#: 10575-H01S)

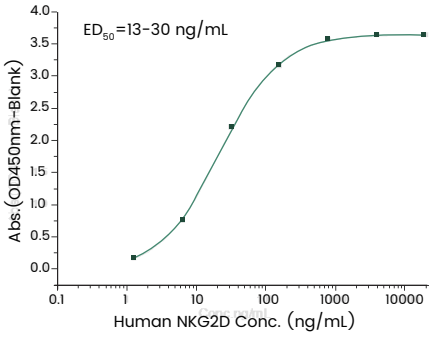


Bind with Human MICA (Cat#: 12302-H08H)

Ligands Bind with NKG2D (Cat#: 10575-H07B)



Human ULBP1 (Cat#: 10679-H03H)



Human ULBP6 (Cat#: 15759-H02H)

Recombinant NKG2A

Human NKG2A (13905-H07H1)
Tag: His
Expressed Host: HEK293 Cells
Purity: > 90 % (SDS-PAGE)
Activity: Testing in progress

Human NKG2A (13905-H07H1-B)
Tag: His
Expressed Host: HEK293 Cells
Purity: > 85 % (SDS-PAGE)
Activity: Testing in progress

Mouse NKG2A (50834-M07H)
Tag: His
Expressed Host: HEK293 Cells
Purity: > 95 % (SDS-PAGE)
Activity: Testing in progress

Human NKG2A (13905-H07H)
Tag: His
Expressed Host: HEK293 Cells
Purity: > 90 % (SDS-PAGE)
Activity: Testing in progress

Recombinant NKG2D

Human NKG2D (10575-H01S)
Tag: Fc
Expressed Host: CHO Cells
Purity: > 95 % (SDS-PAGE)
Activity: Testing in progress

Human NKG2D (10575-H07B)
Tag: His
Expressed Host: Insect Cells
Purity: > 90 % (SDS-PAGE)
Activity: Validated

Mouse NKG2D (57340-M01B)
Tag: Fc
Expressed Host: Insect Cells
Purity: > 90 % (SDS-PAGE)
Activity: Testing in progress

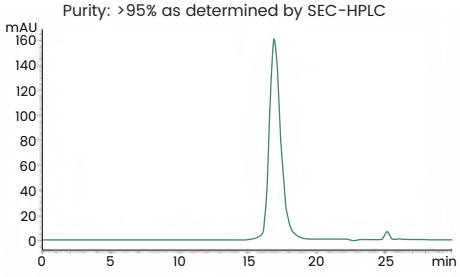
Rhesus NKG2D (90164-C07B)
Tag: His
Expressed Host: Insect Cells
Purity: > 95 % (SDS-PAGE)
Activity: Validated

Recombinant Ligands for NKG2

MICA		MICB	ULBP1		ULBP4
Fc Tag H 12302-H02H	His Tag H 12302-H08H	Fc & His Tag H 10759-H03H	Fc & His Tag H 10679-H03H	His Tag H 10679-H08H	Fc Tag H 16073-H02H
His Tag H 12302-H08H1	His Tag Cy 90924-C08H	His Tag H 10759-H08H	AVI & His Tag H 10679-H27H-B		His Tag H 16073-H08H

Human MICA (Cat#: HPLC-12302-H08H)

Purity: >95% as determined by SEC-HPLC



ULBP6	ULBP2		
Fc Tag H 15759-H02H	Fc Tag H 12143-H02H	His Tag H 12143-H08H	
His Tag H 15759-H08H	AVI & His Tag H 12143-H27H-B		

Note:
H (Human)
Cy (Cynomolgus)

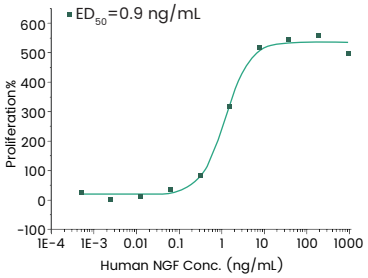
Cytokines

Cytokines are small glycoproteins produced by a number of cell types, predominantly leukocytes, that regulate immunity, inflammation and hematopoiesis. They regulate a number of physiological and pathological process including innate immunity, acquired immunity, and a plethora of inflammatory responses.

Sino Biological has developed 800+ cytokine products from multiple species covering 240+ cytokine molecules, including growth factors, cytokines, chemokines, interferons, interleukins, etc.

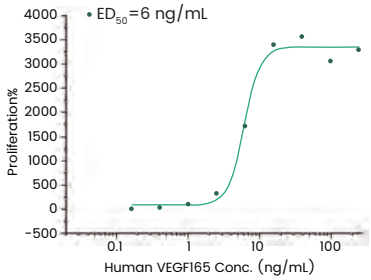
Bioactivity Validated by Cell Based Assays

Human NGF (Cat#: 11050-HNAC)



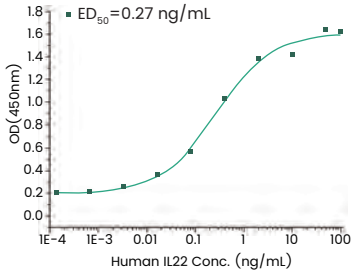
Cell proliferation assay using TF-1 human erythroleukemic cells

Human VEGF165 (Cat#: 11066-HNAH)



Cell proliferation assay using human umbilical vein endothelial cells (HUVEC)

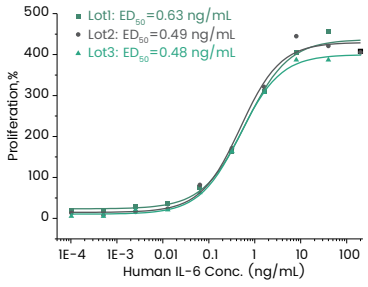
Human IL22 (Cat#: 13059-HNAE)



Induce IL-10 secretion in COLO205 human colorectal adenocarcinoma cells

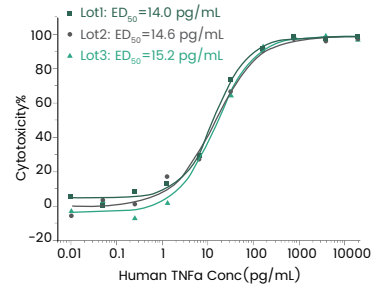
High Batch to Batch Consistency

Human IL-6 (Cat#: 10395-HNAE)



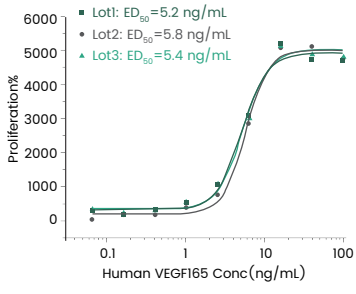
Cell proliferation assay using TF-1 human erythroleukemic cells.

Human TNFa (Cat#: 10602-HNAE)



Cytotoxicity assay using L929 mouse fibrosarcoma cells in the presence of the metabolic inhibitor actinomycin D.

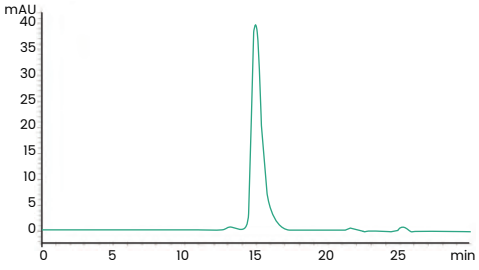
Human VEGF165 (Cat#: HPLC-11066-HNAH)



Cell proliferation assay using human umbilical vein endothelial cells (HUVEC)

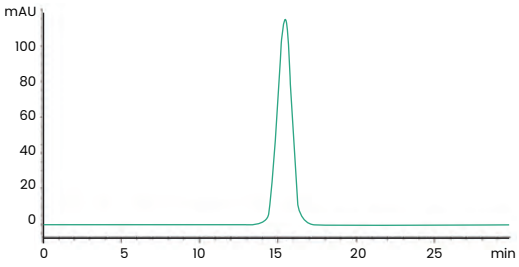
High Purity

Human VEGFA (Cat#: HPLC-11066-HNAH)



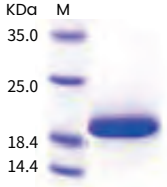
> 95% as determined by SEC-HPLC.

Human GM-CSF (Cat#: HPLC-10015-HNAH)



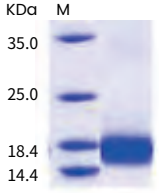
> 95% as determined by SEC-HPLC.

Human IL-33 (Cat#: 10368-HNAE)



> 98% as determined by SDS-PAGE

Human IL17 (Cat#: 12047-HNAE)

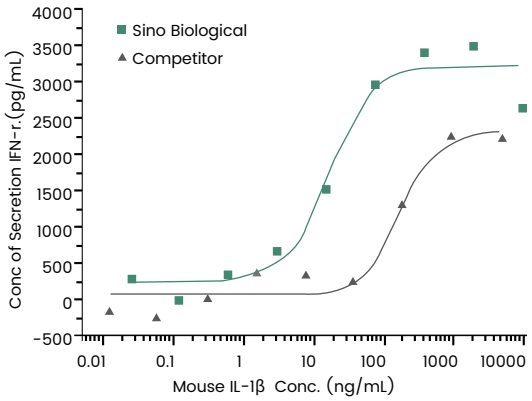


> 97% as determined by SDS-PAGE

Featured Recombinant Cytokines

Recombinant IL-1β Proteins

Compared to the competing product, Sino Biological's IL-1β protein demonstrates a higher bioactivity as shown below.

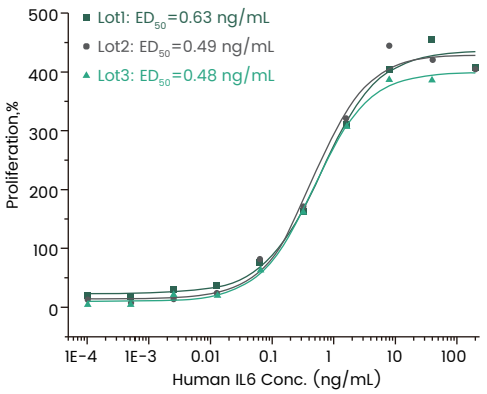


List of Recombinant IL-1β

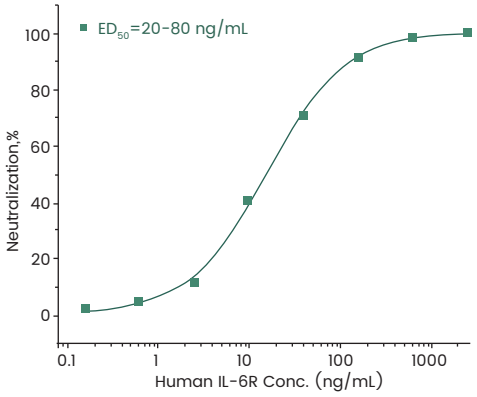
H	10139-H07E (Pro Form)	H	10139-HNAE (Mature Form)	M	50101-MNAE (Mature Form)
R	80023-R07E (Pro Form)	R	80023-RNAE (Mature Form)	Ra	65004-TNAE (Mature Form)
Cy	90010-CNAE (Mature Form)	P	62003-WNAE (Mature Form)	F	67002-UNAE (Mature Form)
C	70018-DNAE (Mature Form)				

Note: H: Human; R: Rat; Ra: Rabbit; M: Mouse; C: Canine; Cy: Cynomolgus; P: Sus scrofa (Pig); F: Feline

Recombinant IL-6 Proteins



Cell Proliferation Assay Using TF-1 Human Erythroleukemic Cells. (Cat#: 10395-HNAE)



Human IL-6R (Cat#: 10398-H08H) enhance the IL-6 activity on M1 mouse myeloid leukemia cells.

List of Bioactive Recombinant IL-6

H	10395-HNAE (Bind to Human IL-6R)
M	50136-MNAE (Cell proliferation)
R	80076-RNAE (Cell proliferation)
P	62006-WNAE (Bind to Human IL-6R)
RH	90197-CNAE (Cell proliferation)

Note: H: Human; R: Rat; M: Mouse; P: Sus scrofa (Pig); Rh: Rhesus

Bioactivity Validated Cytokines (Partial)

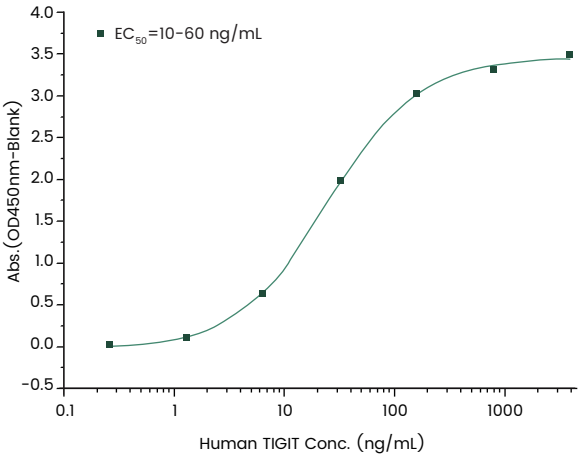
Cat#	Molecule	Species	Purity
10015-HNAH	CSF2	Human	90%
10463-HNAS	HGF	Human	93%
10947-HNAE	IL10	Human	95%
50245-MNAE	IL10	Mouse	95%
12225-HNCE	IL11	Human	95%
10360-HNCE	IL15	Human	95%
10895-H08H	IL17RA	Human	97%
10119-HNCE	IL18	Human	85%
10139-HNAE	IL1B	Human	95%
10584-HNAE	IL21	Human	92%
11483-H08H	IL21R	Human	92%
10165-H08H	IL2RA	Human	97%
10165-H02H	IL2RA	Human	90%
10696-H08B	IL2RB	Human	95%

Cat#	Molecule	Species	Purity
11858-HNAE	IL3	Human	95%
11846-HNAE	IL4	Human	92%
10402-H08H	IL4R	Human	98%
15673-HNCE	IL5	Human	95%
90197-CNAE	IL6	Rhesus	85%
10395-HNAE	IL6	Human	95%
10398-H08H	IL6R	Human	90%
11821-HNAE	IL7	Human	90%
11050-HNAC	NGF	Human	95%
10267-HNAH	NOG	Human	95%
11083-HNAS	RSPO1	Human	95%
10804-HNAC	TGFB1	Human	95%
11066-HNAB	VEGFA	Human	97%

Biotherapeutic Targets

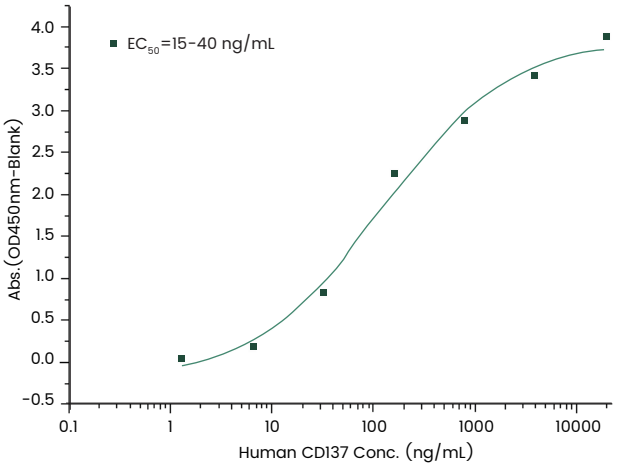
Biotinylated Drug Targets with High Binding Activity

Biotinylated Human TIGIT (Cat#: 10917-H02H-B)



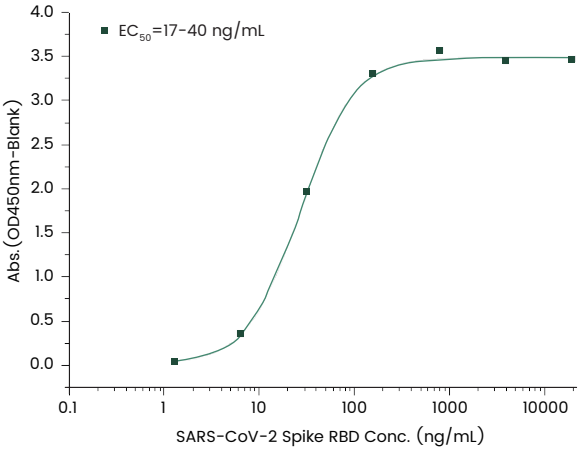
Bind with Human CD155 (Cat#: 10109-H02H)

Biotinylated Human CD137 (Cat#: 10041-H41H-B)



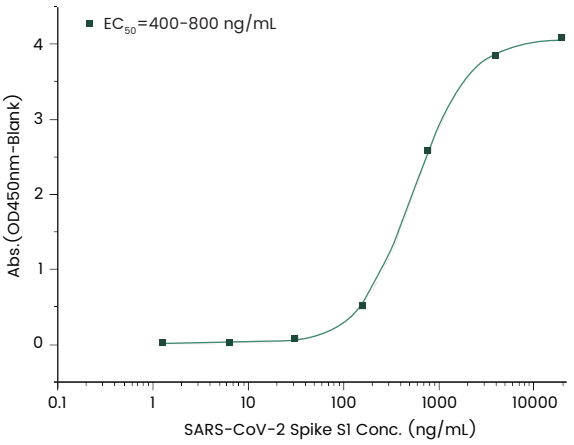
Bind with Human TNFSF9 (Cat#: 15693-H01H)

Biotinylated SARS-CoV-2 Spike RBD (Cat#: 40592-V27B-B)



Bind with Human ACE2 (Cat#: 10108-H05H)

Biotinylated SARS-CoV-2 Spike S1 (Cat#: 40591-V27H-B)



Bind with Human ACE2 (Cat#: 10108-H05H)

List of Recombinant Biotinylated Drug Targets (Partial)

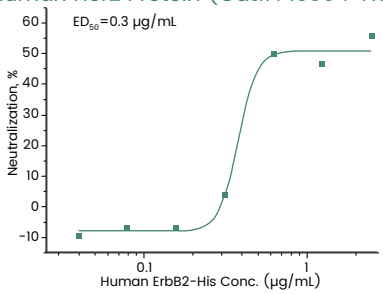
CD27 H 10039-H08B1-B (His Tag)	CD274 H 10084-H08H-B (His Tag)	CD40 H 10774-H08H-B (His Tag)	EGFR H 10001-H08H-B (His Tag)	ERBB2 H 10004-HCCH-B (C-cleavage)	FCGR3A H 10389-H27H1-B (Avi & His Tag)
FCGRT & B2M H CT071-H27H-B (Avi & His Tag)	PCSK9 H 29698-H27H-B (Avi & His Tag)	PVR H 10109-H27H-B (Avi & His Tag)	SIRPA H 11612-H27H-B (Avi & His Tag)	TIGIT H 10917-H08H-B (His Tag)	TNFRSF9 H 10041-H08H-B (His Tag)

Note: H: Human

Featured Drug Targets

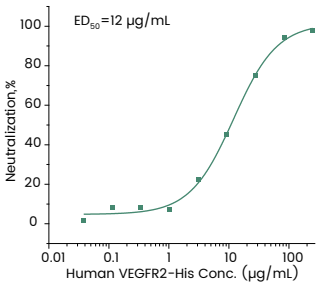
Activity Validated Cancer Therapy Targets

Human Her2 Protein (Cat#: 10004-H08H)



Block anti-ErbB2 mediated inhibition of BT474 human breast ductal carcinoma cell proliferation.

Human VEGFR2 Protein (Cat#: 10012-H08H)



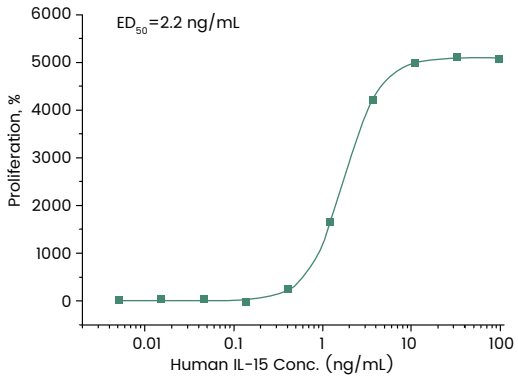
Inhibit the VEGF-dependent proliferation of human umbilical vein endothelial cells (HUVEC).

Products List of Cancer Therapy Targets (Partial)

Molecule	Tag	Tumor Type
CEACAM5	His tag/Fc tag	A variety of solid tumors
c-MET	His tag/Fc tag/Avi-his tag	Breast cancer
EGFR	His tag/Fc tag/Avi-his tag	Colorectal cancer, Advanced EGFR positive solid tumors
EGFRvIII	His tag/Fc tag/Avi-his tag	Glioblastoma
EpCAM	His tag/Fc tag/Avi-his tag/Fc-avi tag	Hepatoma, Gastric cancer
EPHA2	His tag/Avi-his tag	Malignant glioma
HER2	His tag/Fc tag/Avi-his tag	A variety of solid tumors
Glypican-3	His tag/Fc tag/mFc tag	Hepatocellular carcinoma, Squamous cell lung cancer
Mesothelin	His tag/Fc tag	Mesothelioma, Pancreatic cancer, Ovarian cancer
Muc1	Fc tag/mFc tag	Hepatocellular carcinoma, Non-small cell lung cancer, Pancreatic cancer, Breast cancer
PD-1	His tag/Fc tag/mFc tag	Advanced lung cancer, Advanced liver cancer, Advanced gastric cancer
PD-L1	His tag/Fc tag/mFc tag	Glioblastoma
VEGFR2	His tag/Fc tag/Avi-his tag	Metastatic carcinoma, Metastatic melanoma, Renal cancer
IL13RA2	His tag	Glioma
PSMA	His tag	Prostate cancer
FAP	His tag	Malignant pleural mesothelioma
CA9	His tag/Fc tag	Metastatic renal cell carcinoma
FOLR1	His tag	Ovarian cancer
L1CAM	His tag	Ovarian cancer, Neuroblastoma
ROR1	His tag/Fc tag/Avi-his tag	Non-small cell lung cancer, Breast cancer, Leukemia
BCMA	His tag/Fc tag/mFc tag/His-avi tag	Multiple myeloma
IL3RA	His tag/Fc tag	Myeloid malignancies
Syndecan-1	His tag	Multiple myeloma
CD19	His tag/Fc tag	Leukemia, Lymphoma, Multiple myeloma
CD22	His tag/Fc tag/Fc-avi tag	B-cell lymphoma
CD30	His tag/Fc tag	Lymphoma
CD33	His tag/Fc tag/mFc tag	Myeloid malignancies
CD38	His tag/Fc tag/Avi-his tag	Acute myeloid leukemia, Multiple myeloma
CD5	His tag/Fc tag/Avi-his tag	T cell acute lymphoblastic lymphoma
NCAM1	His tag/Avi-his tag	Acute myeloid leukemia
ULBP1	His tag/Avi-his tag/Fc-His tag	A variety of hematological malignancies
ULBP2	His tag/Fc tag/Avi-his tag	A variety of hematological malignancies
IL1RAP	His tag/Fc tag/Avi-his tag	Chronic myeloid leukemia

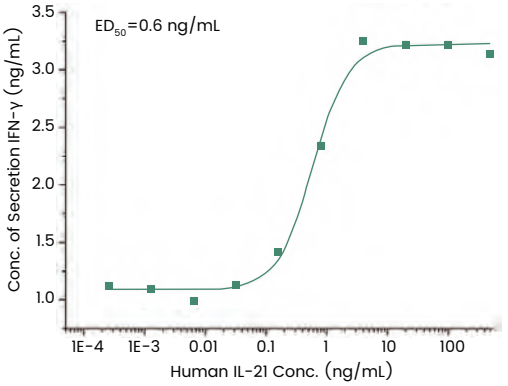
Cytokines for T Cell Expansion

Human IL-15 Protein (Cat#: 10360-HNCE)



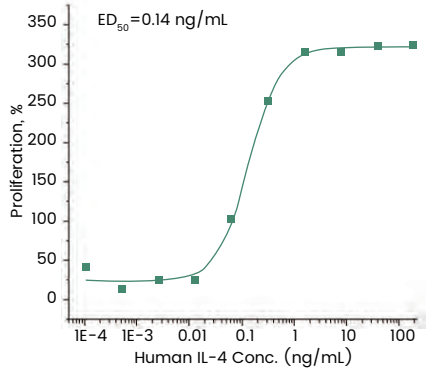
Measured in a cell proliferation assay using MO7e human megakaryocytic leukemic cells.

Human IL-21 Protein (Cat#: 10584-HNAE)



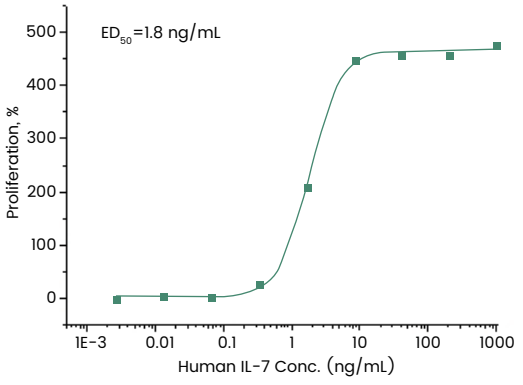
Measured by its ability to induce Interferon-gamma secretion by human natural killer lymphoma NK-92 cells.

Human IL-4 Protein (Cat#: 11846-HNAE)



Measured in a cell proliferation assay using TF-1 human erythroleukemic cells.

Human IL-7 Protein (Cat#: 11821-HNAE)



Measured in a cell proliferation assay using antibody against CD3-activated human peripheral blood lymphocytes (PBL).

○ List of Cytokines for T Cell Expansion

GM-CSF H 10015-HNAH (Native)	IL-15 H 10360-HNCE (N-cleavage)	IL-6 H 10395-HNAE (Native)	IL-7 H 11821-HNAE (Native)	IL-12 H CT011-H08H (His Tag)
IL-21 H 10584-HNAE (Native)	TNF alpha H 10602-HNAE (Native)	EGF H 10605-HNAE (Native)	IFN-gamma H 11725-HNAS (Native)	IL-4 H 11846-HNAE (Native)

Note: H: Human

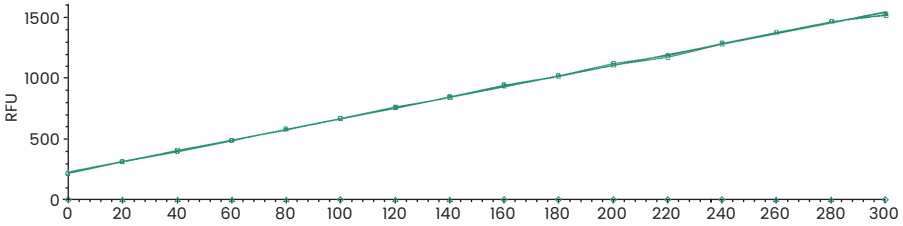
Target Proteins with Enzymatic Activity

○ Kinases (Partial)

Molecule	Species	Bioactivity	Sequence
EGFR	Human	The specific activity was determined to be>70 nmol/min/mg using Poly (Glu, Tyr) 4:1 as the substrate	Met668-Ala1210
PDGFRA	Human	The specific activity was determined to be 8 nmol/min/mg using MBP as the substrate	Gln551-Leu1089
IGF1R	Human	The specific activity was determined to be 554 nmol/min/mg using Poly (Glu, Tyr) 4:1 as the substrate	Met954-Cys1367
EphA2	Human	The specific activity was determined to be 50 nmol/min/mg using Poly (Glu, Tyr) 4:1 as the substrate	Leu585-Ile976
VEGFR2/KDR	Human	The specific activity was determined to be 10 nmol/min/mg using Poly (Glu, Tyr) 4:1 as the substrate	Asp807-Val1356
ROR1	Human	The specific activity was determined to be 0.3 nmol/min/mg using MBP as the substrate	Met453-Asn783
c-MET	Human	The specific activity was determined to be 10 nmol/min/mg using MBP as the substrate	Lys956-Ser1390
FGFR2	Human	The specific activity was determined to be 28 nmol/min/mg using Poly (Glu, Tyr) 4:1 as the substrate	Met400-Thr821
CD45	Mouse	The specific activity was determined to be 12306 nmol/min/mg using p-nitrophenyl phosphate as the substrate	Arg453-Ser1152

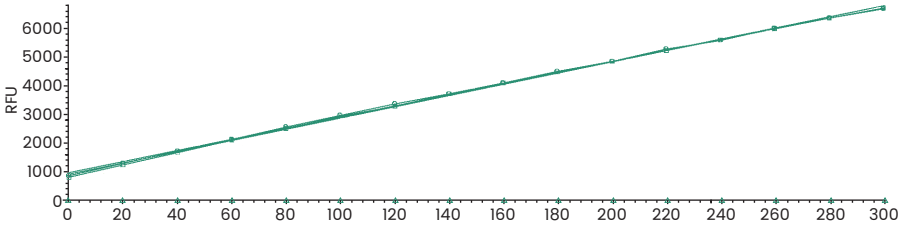
○ Other Enzymes

Recombinant Human FAP Protein (ECD, His Tag)



Cat#: 10464-H07H
Ability to convert the substrate benzyloxycarbonyl-Gly-Pro-7-amido-4-methylcoumarin (Z-GP-AMC) to Z-Gly-Pro and 7-amino-4-methylcoumarin (AMC).

Recombinant Human DPP4/CD26 Protein



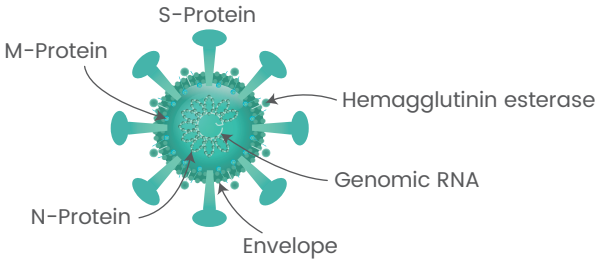
Cat#: 10688-HNCH
Ability to cleave a fluorogenic peptide substrate, Gly-Pro-7-amido-4-methylcoumarin (GP-AMC).

○ Protein Molecules (Partial)

DPP4/CD26	Factor IX	ENTPD3	PRSS2	CD73	Carbonic Anhydrase IX
FAP	CD39	ADAM17	MMP-9	CD38	Chymotrypsin C
LOXL2	PRSS3	Kallikrein 8	Cathepsin B	Cathepsin S	ADAM8/CD156a

Human Coronavirus Proteins

To support the fight against the coronavirus, Sino Biological has developed a panel of recombinant viral antigens, including key proteins from all known human coronaviruses.

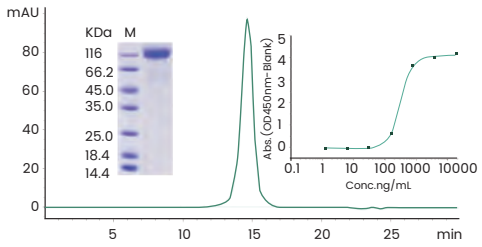


SARS-CoV-2 Antigens

Sino Biological has developed a comprehensive collection of SARS-CoV-2 antigens. The available products include the N protein, S protein, the S1, S2 subunits and the RBD domain of the S protein, the envelope protein, Plpro, 3CLPro and many other antigens.

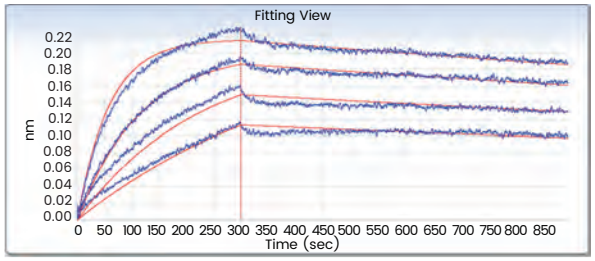
SARS-CoV-2 Spike Proteins

SARS-CoV-2 S1, His tag, expressed in HEK293



Purity: >95% by SDS-Page & SEC-HPLC
Activity: Bind with ACE2 in ELISA

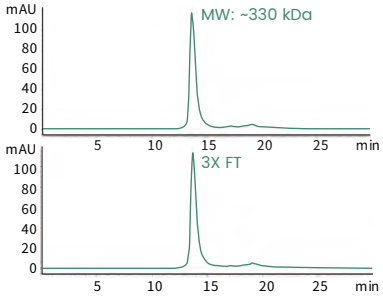
SARS-CoV-2 S-RBD, mFc tag, expressed in HEK293



Activity: Bind with ACE2 by Octet

SARS-CoV-2 Nucleocapsid Protein

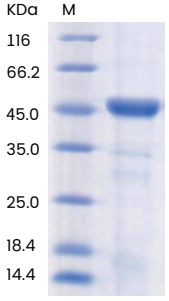
SARS-CoV-2 N Recombinant Protein-His tag (Cat#: 40588-V07E)



The protein is stable after 3X freeze-thaw (FT) cycles and presented as an oligomer.

SARS-CoV-2 Envelope Protein

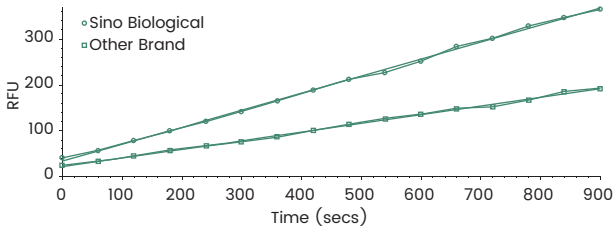
SARS-CoV-2 Envelope (C40A, C43A, C44A) His & MBP Recombinant Protein (Cat#: 40609-V10E3)



>90% as determined by SDS-PAGE

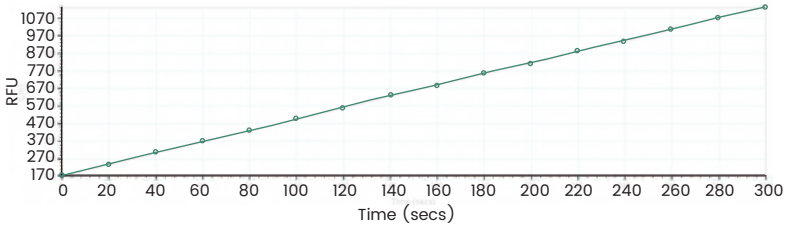
Bioactive SARS-CoV-2 Proteases

3CLPro Protein (Cat#: 40594-V07B)



Ability to cleave a peptide substrate, Dabcyl-KTSAVLQS-GFRKME-Edans compared with other brand.

PlPro Protein (Cat#: 40593-V07E)



Ability to cleave a fluorogenic peptide substrate, Arg-Leu-Arg-Gly-Gly-AMC (RLRGGAMC).

List of SARS-CoV-2 Antigens (Partial)

Sino Biological provides a collection of high-quality SARS-CoV-2 antigens with multiple kinds of tags, including biotinylated proteins. These antigens can be used for scientific research and the detection of specific antibodies.

N 	40588-V08B (His tag | Insect cell expressed) 40588-V07E (His tag | *E. coli* cell expressed) 40588-V08B-B (His tag | Insect cell expressed | Biotinylated) 40588-V27B-B (Avi & His tag | Insect cell expressed | Biotinylated)
S1 	40591-V08H (His tag | HEK293 cell expressed) 40591-V02H (Fc tag | HEK293 cell expressed) 40591-V05H1 (mFc tag | HEK293 cell expressed) 40591-V08B1 (His tag | Insect cell expressed) 40591-V08H-B (His tag | HEK293 cell expressed | Biotinylated) 40591-V27H-B (Avi & His tag | HEK293 cell expressed | Biotinylated)
S2 	40590-V08B (His tag | Insect cell expressed) 40590-V02H (Fc tag | HEK293 cell expressed) 40590-V05B (mFc tag | Insect cell expressed)
NSP 	NSP3, 40638-V07E (His tag | *E. coli* cell expressed) NSP7, 40617-VNCE (*E. coli* cell expressed) NSP8, 40618-V17E (Avi tag | *E. coli* cell expressed) NSP9, 40619-V40E (Avi & His tag | *E. coli* cell expressed) NSP10, 40599-V07E (His tag | *E. coli* cell expressed) NSP10, 40599-VNCE (*E. coli* cell expressed)
Plpro 	40596-V07E (His tag | *E. coli* cell expressed)
S-RBD 	40592-V02H (Fc tag | HEK293 cell expressed) 40592-V05H (mFc tag | HEK293 cell expressed) 40592-V08H (His tag | HEK293 cell expressed) 40592-V08B (His tag | Insect cell expressed) 40592-V31H (rFc tag | HEK293 cell expressed) 40592-VNAH (HEK293 cell expressed) 40592-V08B-B (His tag | Insect cell expressed | Biotinylated) 40592-V08H-B (His tag | HEK293 cell expressed | Biotinylated) 40592-V27B-B (Avi & His tag | Insect cell expressed | Biotinylated) 40592-V27H-B (Avi & His tag | HEK293 cell expressed | Biotinylated) 40592-V08H82-B (His tag | HEK293 cell expressed | Biotinylated)
S1+S2 ECD 	40589-V08B1 (His tag | Insect cell expressed)
ME 	40598-V07E (His tag | *E. coli* cell expressed)
RDRP 	40595-V08B (His tag | Insect cell expressed)
E 	40609-V10E3 (His tag | *E. coli* cell expressed)
3CLpro 	40594-V07B (His tag | Insect cell expressed) 40594-V56E (Avi & His tag | *E. coli* cell expressed)

150+ Recombinant SARS-CoV-2 Mutants

Emerging SARS-CoV-2 mutations may pose challenges to vaccines, drugs and diagnostics development. Sino Biological has developed 150+ recombinant variants carrying mutations from latest identified lineages (B.1.617 first detected in India for example) to help evaluate the efficacy of the antibodies and vaccination.

Mutations in Multiple Domains

- RBD
- S1
- Spike ECD
- Spike NTD
- S
- Nucleocapsid

New Lineages

- Alpha | B.1.1.7 (U.K.*)
- Beta | B.1.351 (South Africa*)
- Gamma | P.1 (Brazil*)
- Delta | B.1.617.2 (India*)
- Epsilon | B.1.427/B.1.429 (U.S.A*)
- Iota | B.1.526 (U.S.A*)
- Kappa | B.1.617.1 (India*)
- B.1.617.3 (India*)

High Frequency Mutations

- N (A220V)
- N (R203K, G204R)
- N (p67S)
- N (P199L)
- N (M234L)

*Country or Region: Area that the variant was first detected.

SARS-CoV-2 Spike Variants

Several new variants of SARS-CoV-2 virus have emerged in recent months. The U.K. variant B.1.1.7, the Brazil variant P.1, the South Africa variant B.1.351 ,and the most recent Indian variant B.1.617 are particular concerning because of their high prevalence. Sino Biological has launched RBD and Spike proteins of these variants.

○ Recombinant RBD Variants

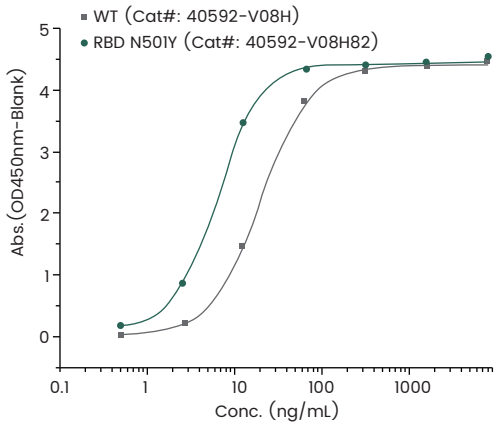
Lineage	Mutations	Cat#	Tag
B.1.1.7	N501Y	40592-V02H1	Fc
B.1.1.7	N501Y	40592-V08H82	His
B.1.351	K417N,E484K,N501Y	40592-V08H85	His
B.1.351	E484K	40592-V31H2	rFc
B.1.351	K417N, E484K, N501Y	40592-V31H4	rFc
B.1.351	K417N	40592-V31H6	rFc
B.1.617.2	L452R, T478K	40592-V08H90	His
P.1	K417T,E484K,N501Y	40592-V08H86	His
P.1	K417T, E484K, N501Y	40592-V31H5	rFc

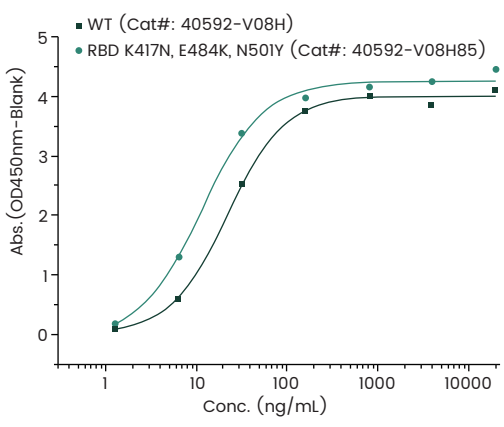
○ Recombinant S1+S2 ECD Variants

Lineage	Mutations	Cat#	Tag
B.1.1.7	HV69-70 deletion, Y144 deletion, N501Y, A570D, D614G, P681H, T716I, S982A, D1118H	40589-V08B6	His
B.1.351	L18F, D80A, D215G, LAL242-244 deletion, R246I, K417N, E484K, N501Y, D614G, A701V	40589-V08B7	His
B.1.351	D80A, K417N, E484K, N501Y, D614G, A701V	40589-V08B9	His
P.1	L18F, T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, D614G, H655Y, T1027I, V1176F	40589-V08B10	His

○ Binding Affinity to ACE2

As shown below, both recombinant spike RBD N501Y of lineage B.1.1.7 (Cat#: 40592-V08H82) and spike RBD K417N, E484K, N501Y (Cat#: 40592-V08H85) of lineage B.1.351 revealed a higher binding affinity to ACE2 compared to the wild type.





○ List of Recombinant Spike Variants (Partial)

Lineage	Antigen	Mutations	Cat#
B.1.617	RBD	L452R, E484Q	40592-V08H88
	S1	D614G, E154K, E484Q, L452R, P681R	40591-V08H19
B.1.1.7	S1	△H69/△V70, N501Y, D614G	40591-V08H7
	S1	H69del, V70del, Y145del, N501Y, A570D, D614G, P681H	40591-V08H12
B.1.351	RBD	K417N	40592-V08H59
	RBD	E484K	40592-V08H84
	S1	K417N, E484K, N501Y, D614G	40591-V08H10
	S1	del(L242, A243, L244), D215G, D80A, E484K, K417N, L18F, N501Y, R246I, D614G	40591-V08H15
	S1	del(L242, A243, L244), L18F, D80A, D215G, R246I	40591-V08H13
P.1	S1	L18F, T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, D614G, H655Y	40591-V08H14
B.1.429	RBD	L452R	40592-V08H28
	S1	W152C, L452R, D614G	40591-V08H17
B.1.525	S1	Q677H	40591-V08H16
Cluster 5	RBD	Y453F	40592-V08H80
	S1	H69del, V70del, Y453F, D614G	40591-V08H8
Others	RBD	S477R	40592-V08H64
	RBD	D405V, Q414A	40592-V08H22
	RBD	V367F	40592-V08H1
	RBD	N487R	40592-V08H75
	RBD	A344S	40592-V08H37
	RBD	F377L	40592-V08H27
	RBD	N370S	40592-V08H43
	RBD	P479S	40592-V08H57
	RBD	T385A	40592-V08H47
	RBD	I472V	40592-V08H35
	RBD	K458R	40592-V08H7
	RBD	S477N	40592-V08H46
	RBD	F490L	40592-V08H83
	RBD	P521S	40592-V08H29
	RBD	V341I	40592-V08H11
	RBD	V503F	40592-V08H15

Lineage	Antigen	Mutations	Cat#
Others	RBD	N439K	40592-V08H14
	RBD	T478I	40592-V08H30
	RBD	V483I	40592-V08H31
	RBD	F338L	40592-V08H26
	RBD	A522V	40592-V08H16
	RBD	Q409E	40592-V08H34
	RBD	Q414E	40592-V08H23
	RBD	V367F	40592-V05H1
	RBD	V367F	40592-V08H1
	RBD	E484Q	40592-V08H81
	RBD	A435S	40592-V08H4
	RBD	V483A	40592-V08H5
	RBD	Y508H	40592-V08H12
	RBD	A475V	40592-V08H50
	RBD	A348S	40592-V08H25
	RBD	A352S	40592-V08H58
	RBD	A372S	40592-V08H19
	RBD	A372T	40592-V08H36
	RBD	A520S	40592-V08H20
	RBD	A520V	40592-V08H39
	RBD	A522S	40592-V08H21
	RBD	E406Q	40592-V08H40
	S1	T20N, D614G	40591-V08H5
	S1	N234Q	40591-V08H11
	S1	A222V, D614G	40591-V08H4
	S1	L18F, D614G	40591-V08H6
	S1	HV69-70 deletion, N439K, D614G	40591-V08H9
	S1	D614G	40591-V02H3
	S1	D614G	40591-V08H3
	S1	HV69-70 deletion, Y453F, D614G	40591-V08H8
	S1+S2 ECD	R683A, R685A, F817P, A892P, A899P, A942P, K986P, V987P	40589-V08H4
	S1+S2 ECD	D614G	40589-V08B4
	S1+S2 ECD	HV69-70 deletion, D614G, D796H	40589-V08B5

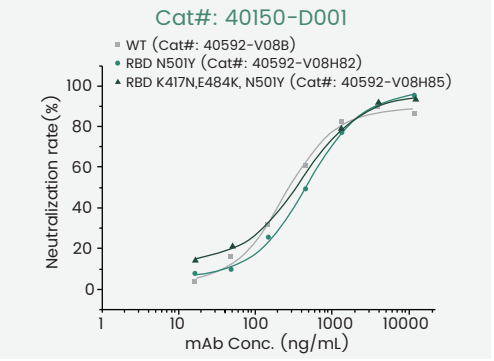
○ Neutralizing Efficacy Assays against SARS-CoV-2 Spike Variants

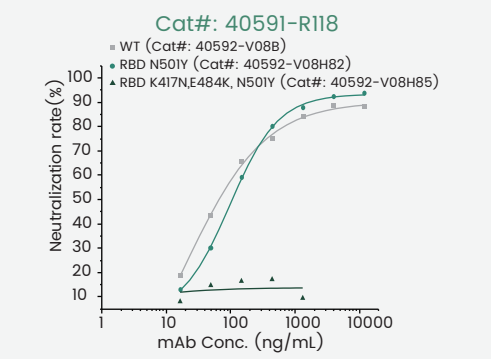
Some of the above mutations may have allowed the virus to escape from neutralizing antibodies. To characterize these variants, a new panel of monoclonal antibodies have been launched. These antibodies demonstrate differential neutralizing activities against different variants validated by Competitive ELISA Assay. Notably, the B.1.351 and P.1 variants seem to be immune to a subset of the antibodies.

Neutralization Activity by Competitive ELISA Assay

Neutralizing Antibodies	WT RBD	Recombinant RBD				Recombinant S1	
		B.1.1.7	B.1.351	P.1	B.1.617	B.1.617	B.1.429
40150-D001	++	+	++	++	++	++	++
40150-D002	++	+	+	++	++	++	++
40591-MM43	++	++	++	++	++	++	++
40592-R001	+++	+++	-	-	+++	+++	+++
40592-R118	+++	+++	-	-	+	+	+
40592-R117	+++	+++	-	-	+++	+++	+++

+: Neutralizing Capacity

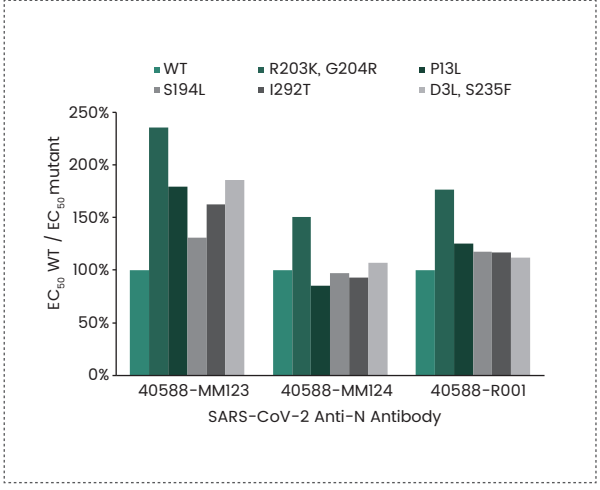




The Aforementioned Recombinant RBDs:
WT: 40592-V08B
B.1.1.7 | U.K. Variant: 40592-V08H82 (N501Y)
B.1.351 | South Africa Variant: 40592-V08H85 (K417N, E484K, N501Y)
P.1 | Brazil Variant: 40592-V08H86 (K417T,E484K,N501Y)
B.1.617 | India Variant: 40592-V08H88 (L452R, E484Q)
The Aforementioned Recombinant S1 :
B.1.617 | India Variant: 40591-V08H19 (E154K, E484Q, L452R, D614G, P681R)
B.1.429 | California Variant: 40591-V08H17 (W152C, L452R, D614G)

SARS-CoV-2 Nucleocapsid Variants

Recombinant N antigens with high frequency mutations can be used for antibody development and antigen diagnostics of SARS-CoV-2.



Anti-N Antibodies		
40588-MM123 (Mouse mAb)	40588-MM124 (Mouse mAb)	40588-R001 (Rabbit mAb)

Recombinant N Antigens		
40588-V07E1 R203K, G204R (B.1.1.7, B.1.351, P.1, etc.)	40588-V07E2 P13L (B.1.1.7, B.1.351, A.2.2, etc.)	40588-V07E3 S194L (B.1.1.7, B.1.237, etc.)
40588-V07E4 I292T (B.1.1.7, etc.)	40588-V07E8 D3L, S235F (B.1.1.7)	

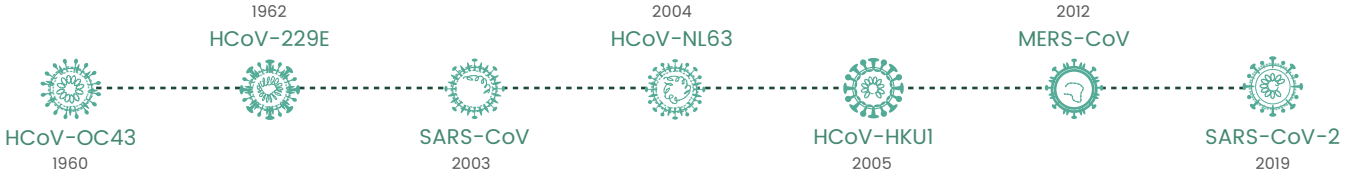
○ List of Nucleocapsid Variants

Lineage B.1.1.7 (U.K.)		Lineage P.1 (Brazil)		Lineage B.1.351 (South Africa)
40588-V07E7 (D3L, R203K, G204R, S235F)	40588-V07E8 (D3L, S235F)	40588-V07E11 (P80R)	40588-V07E4 (I292T)	40588-V07E9 (T205I)

Others				
40588-V07E2 (P13L)	40588-V07E1 (R203K, G204R)	40588-V07E3 (S194L)	40588-V07E16 (D377Y)	40588-V07E17 (E378Q)

Other Human Coronavirus Antigens (Partial)

It's essential to identify cross-reactivity issues early in assay development. The main concern for SARS-CoV-2 antigen detection is the cross-reactivity against other circulating coronavirus types, including HCoV-HKU1, HCoV-OC43, HCoV-NL63, HCoV-229E, SARS-CoV, and MERS-CoV. Sino Biological has developed a comprehensive panel of N and S proteins for all known human coronaviruses.



CoVs	Spike			Nucleocapsid
SARS-CoV	40150-V08B1 S1 Subunit, His Tag	40150-V05H1 S1 Subunit, mFc Tag	40150-V08B3 S2 Subunit, His Tag	40143-V08B His Tag
	40150-V08B2 S-RBD, His Tag	40150-V31B2 S-RBD, rFc Tag	40150-V05H S-RBD, mFc Tag	
	40150-V08B1-B S1 Subunit, His Tag, Biotinylated	40634-V08B S1+S2 ECD (577 S/A), His Tag	40150-V08B2-B S-RBD, His Tag	
MERS-CoV	40069-V08B1 S1 Subunit, His Tag	40069-V08H S1 Subunit, His Tag	40070-V08B S2 Subunit, His Tag	40068-V08B His Tag
	40071-V08B1 S-RBD, His Tag	40071-V05B S-RBD, mFc Tag	40071-V31B S-RBD, rFc Tag	
	40071-V31B1 S-RBD, rFc Tag	40069-V08B S1+S2 ECD, His Tag	HPLC-40069-V08H S1 Subunit, His Tag, HPLC-verified	
	40071-V08B1-B S-RBD, His Tag			
HCoV-HKU1	40021-V08H S1 Subunit, His Tag	40602-V08H S1 Subunit, His Tag	40606-V08B S1+S2 ECD, His Tag	40642-V07E His Tag
HCoV-NL63	40600-V08H S1 Subunit, His Tag	40604-V08B S1+S2 ECD, His Tag		40641-V07E His Tag
HCoV-OC43	40607-V08H1 S1 Subunit, His Tag	40607-V08B1 S2 ECD, His Tag	40607-V08B S1+S2 ECD, His Tag	40643-V07E His Tag
HCoV-229E	40601-V08H S1 Subunit, His Tag	40607-V08H1 S1+S2 ECD, His Tag	40605-V08B S1+S2 ECD, His Tag	40640-V07E His Tag

Influenza Viral Antigen Bank

The influenza viral antigen bank features 600+ antigen products from over 300 strains, including the pandemic strains such as the 2009 swine flu (A/California/04/2009 (H1N1)), and vaccine strains from 2015-2022.

10+ Antigens	60+ Subtypes	300+ Strains
HA (HA0, HA1, HA2), NA, NP, M1, M2, NS1, NS2, PB1, PB2, PA, etc.	H1-H18, N1-N11, Influenza B	Vaccine Strains, HPAI Strains, New Strains, etc.

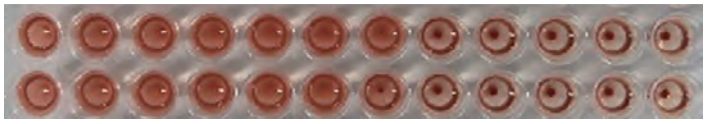
HA Proteins

○ Full Length HA (HA0) Proteins

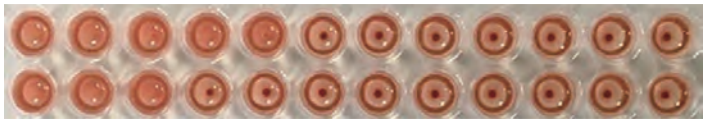
Cat#	Subtype	Strain
11055-VNAB	H1N1	A/California/04/2009
40043-VNAB	H3N2	A/Perth/16/2009
40153-VNAB	H3N2	A/Babol/36/2005
40497-VNAB	H3N2	A/Switzerland/9715293/2013
40359-VNAB	H10N8	A/Jiangxi-Donghu/346/2013
40191-VNAB	Influenza B	B/Massachusetts/03/2010
40498-VNAB	Influenza B	B/PHUKET/3073/2013

○ High Activity

-- High Hemagglutination Activity



H3N2 (A/Wisconsin/67/2005) (Cat#: 11972-V08B)



H7N9 (A/Anhui/1/2013) (Cat#: 40103-V08B)

○ HA-specific B Cell Probes

Specifically binding to B cell that expressed HA-specific Abs

Cat#	Subtype	Strain	Mutation
11055-V08B1	H1N1	A/California/4/2009	Tyr 108 Phe
11683-V08B1	H1N1	A/New Caledonia/20/99	Tyr 108 Phe
40043-V08B1	H3N2	A/Perth/16/2009	Tyr 108 Phe
11060-V08B1	H5N1	A/Indonesia/5/2005	Tyr 107 Phe

-- Binding Activity to Sialic Acid

Cat#	Subtype	Strain
40118-V08B	H3N2	A/California/7/2004
40123-V08B	H7N9	A/Hangzhou/3/2013
40325-V08B	H7N9	A/Zhejiang/DTID-ZJU10/2013
11085-V08B	H1N1	A/California/07/2009

NA Proteins

○ High Enzymatic Activity

Cat#	Subtype	Strain
40196-VNAHC	H1N1	A/Puerto Rico/8/1934
40235-VNAHC	H4N6	A/mallard/Ohio/657/2002
40045-VNAHC	H5N1	A/Egypt/2321-NAMRU3/2007
40202-VNAHC	H7N7	A/Netherlands/219/03
40108-VNAHC	H7N9	A/Anhui/1/2013
40109-VNAHC	H7N9	B/Shanghai/1/2013
40034-VNAHC	H9N2	A/Chicken/Hong Kong/G9/97

○ Drug-resistant NA Mutants

Cat#	Subtype	Strain	Mutation
11058-VNAHC1	H1N1	A/California/04/2009	H274Y
11058-VNAHC2	H1N1	A/California/04/2009	N295S
11676-VNAHC1	H5N1	A/Anhui/1/2005	H274Y
40017-VNAHC1	H3N2	A/Babol/36/2005	E119V
40017-VNAHC2	H3N2	A/Babol/36/2005	N294S
40017-VNAHC3	H3N2	A/Babol/36/2005	R292K
40017-VNAHC4	H3N2	A/Babol/36/2005	H274Y

More Recombinant Influenza Antigens

H1N1

A/California/4/2009
HA: 11055-VNAB, 11055-V08B, 11055-V08B-B
NA: 11058-V01H, 11058-V07B, 11058-V08B

A/Puerto Rico/8/34/Mount Sinai
NP: 11675-V08B, 11675-V08B-B

Influenza B

B/Florida/4/2006
HA: 11053-V08H1, 11053-V04H2, 11053-V08H
NP: 40438-V08B

B/Malaysia/2506/2004
HA: 11716-V08B, 11716-V08H1, 11716-V08H

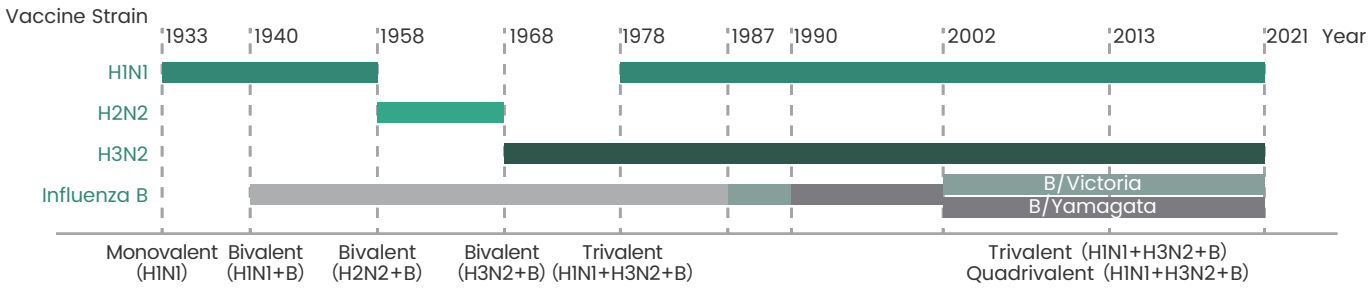
H3N2

A/Aichi/2/1968
HA: 11707-V08H, 11707-V08B, 11707-V08H1
NA: 40199-VNAHC, 40199-V07H
NP: 40207-V08B

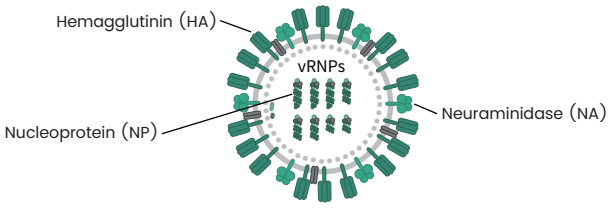
A/Brisbane/10/2007
HA: 11056-V08B, 11056-V08H, 11056-V08H1

Recombinant Antigens for Influenza Vaccine Strains

Seasonal flu is a common infectious disease of the respiratory tract caused by influenza virus. Vaccination is the most effective way to prevent flu infection. Each year, several different flu strains are selected as vaccine strains based on surveillance data of the recent isolates, and the performance of the vaccines from the previous season. In recent decades, most vaccines are trivalent or quadrivalent, including one H1N1, one H3N2, and the Yamagata and Victoria type flu B.



Sino Biological has newly released a panel of recombinant antigen products covering all WHO-recommended vaccine strains from 2015-2022. These products include HA, NA, and nucleoproteins (NP) and they are designated to be used for a variety of biochemical assays including antibody titer assay, vaccine efficiency assay, and antigenic change assay.



Strains	HA	NA	NP	Year
A/Brisbane/02/2018 (H1N1)	40719-V08H	40767-V08B	40776-V08B	2019-2020
A/California/7/2009 (H1N1)	11085-V08B		40205-V08B	2016-2017, 2015-2016
A/Cambodia/e0826360/2020 (H3N2)	40789-V08H 40789-V08H1	40784-V08B	40778-V08B	2021-2022
A/Guangdong-Maonan/SWL1536/2019 (H1N1)	40717-V08H		40723-V08B	2020-2021
A/Hawaii/70/2019 (H1N1)	40717-V08H		40724-V08B	2020-2021
A/Hong Kong/2671/2019 (H3N2)	40721-V08H		40753-V08B	2020-2021
A/Hong Kong/45/2019 (H3N2)	40765-V08H		40754-V08B	2020-2021
A/Hong Kong/4801/2014 (H3N2)	40555-V08B	40569-V08B	40781-V08B	2017-2018, 2016-2017
A/Kansas/14/2017 (H3N2)	40720-V08H	40766-V08B	40779-V08B	2019-2020
A/Michigan/45/2015 (H1N1)	40567-V08H1	40568-V08B	40777-V08B	2018-2019, 2017-2018
A/Singapore/INFIMH-16-0019/2016 (H3N2)	40580-V08H		40779-V08B	2018-2019
A/Switzerland/9715293/2013 (H3N2)	40497-V08B		40499-V08B	2015-2016
A/Victoria/2570/2019 (H1N1)	40787-V08H 40787-V08H1	40785-V08B	40774-V08B	2021-2022
A/Wisconsin/588/2019 (H1N1)	40787-V08H 40787-V08H1	40785-V08B	40774-V08B	2021-2022
B/Brisbane/60/2008	40016-V08B	40203-VNAHC	40783-V08B	2017-2018, 2016-2017, 2015-2016
B/Colorado/06/2017	40581-V08H		40782-V08B	2019-2020, 2018-2019
B/Phuket/3073/2013	40498-V08B	40502-V07B	40500-V08B	2021-2022, 2020-2021, 2019-2020, 2018-2019, 2017-2018, 2016-2017, 2015-2016
B/Washington/02/2019	40722-V08H	40790-V08B	40755-V08B	2021-2022, 2020-2021

Recombinant Proteins for Other Viruses

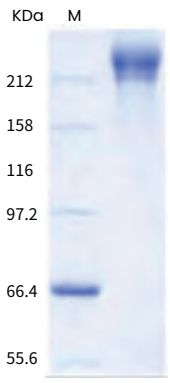
To support virus research, Sino Biological has developed a big recombinant antigen bank covering different kinds of viruses that cause different diseases, such as respiratory disease, tropical & vector-borne disease, blood-borne disease, hand, foot, and mouth disease, and animal disease.

Respiratory Disease	CMV	EV-D68	HAdV-B	HAdV-E	HPIV-4	RSV
	EBV	Influenza A	SARS-CoV-2	HCoV-229E	HCoV-HKU1	HCoV-NL63
	HCoV-OC43	MERS-CoV	SARS	Influenza B		
Tropical & Vector-borne Disease	DENV	CHIKV	WNV	ZIKV	RVFV	
Blood-borne Disease	HIV	HBV	HCV			
Hand, foot, and mouth Disease	EV71	CV				
Other Diseases	PCV2	SIV	Vaccinia Virus	DcCoV	HeV	HTNV
	VSIV	EBOV	CyCMV			

Note: More viral antigens of the other virus, please refer to https://www.sinobiological.com/research/virus

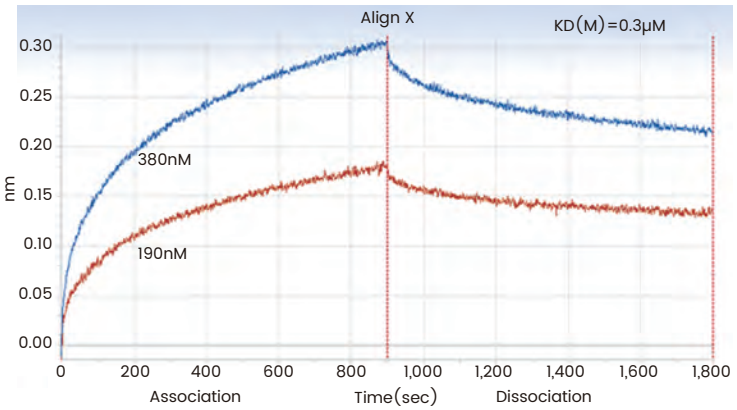
○ Data Illustration of HIV-1 gp140 Protein (Cat#: 11677-V02H)

High Purity



SDS-PAGE＞95%

High Activity Viral Proteins



gp140 bind to CD4

For specific requirement of recombinant SARS-CoV-2 proteins, please contact us: cro_us@sinobiologicalus.com.

Recombinant Protein Production Service

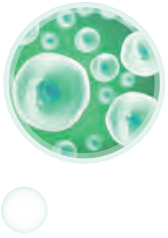
Sino Biological provides one-stop service from gene synthesis to protein expression & purification. With >10 years of experience in protein expression and purification, Sino Biological has successfully expressed >6000 different proteins for customers.

Advantages of Recombinant Protein Platforms

- High-efficiency expression vectors
- High-density cell culture technology
- Proprietary transfection reagent & medium formulation
- High-throughput and large-scale protein production

Four Protein Production Systems

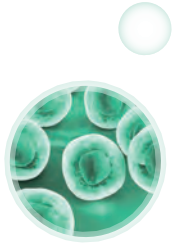
HEK293/CHO transient expression service



Baculovirus-insect expression service

E.coli expression service

CHO/HEK293 stable cell line development



Recombinant Protein Production Service Overview

Service Description	**Gene synthesis and codon optimization (optional) (1-2 weeks)** Free use of existing genetic templates from Sino Biological
	Vector construction and large-scale plasmid preparation (1-2 weeks) Construction of high-efficiency expression vectors
	Pilot study for protein expression and purification (4-6 weeks for Baculovirus-insect expression; 2-4 weeks for others) Small scale protein production to assess the feasibility and yield of the protein expression and purification
	Large-scale production (2-4 weeks) Scale-up production according to pilot study, providing bulk purified proteins
QC Analysis	SDS-PAGE, UV Optional: HPLC-SEC, Endotoxin test, MS, ELISA, Activity, etc.
Deliverables	Purified proteins QC report

Sino Biological Europe GmbH
Düsseldorfer Str. 40, 65760 Eschborn, Germany
Tel: +49(0)6196 9678656
Fax: +49(0)6196 9678657
Website: www.sinobiological.com
Email: order_eu@sinobiologicaleu.com

Follow us on