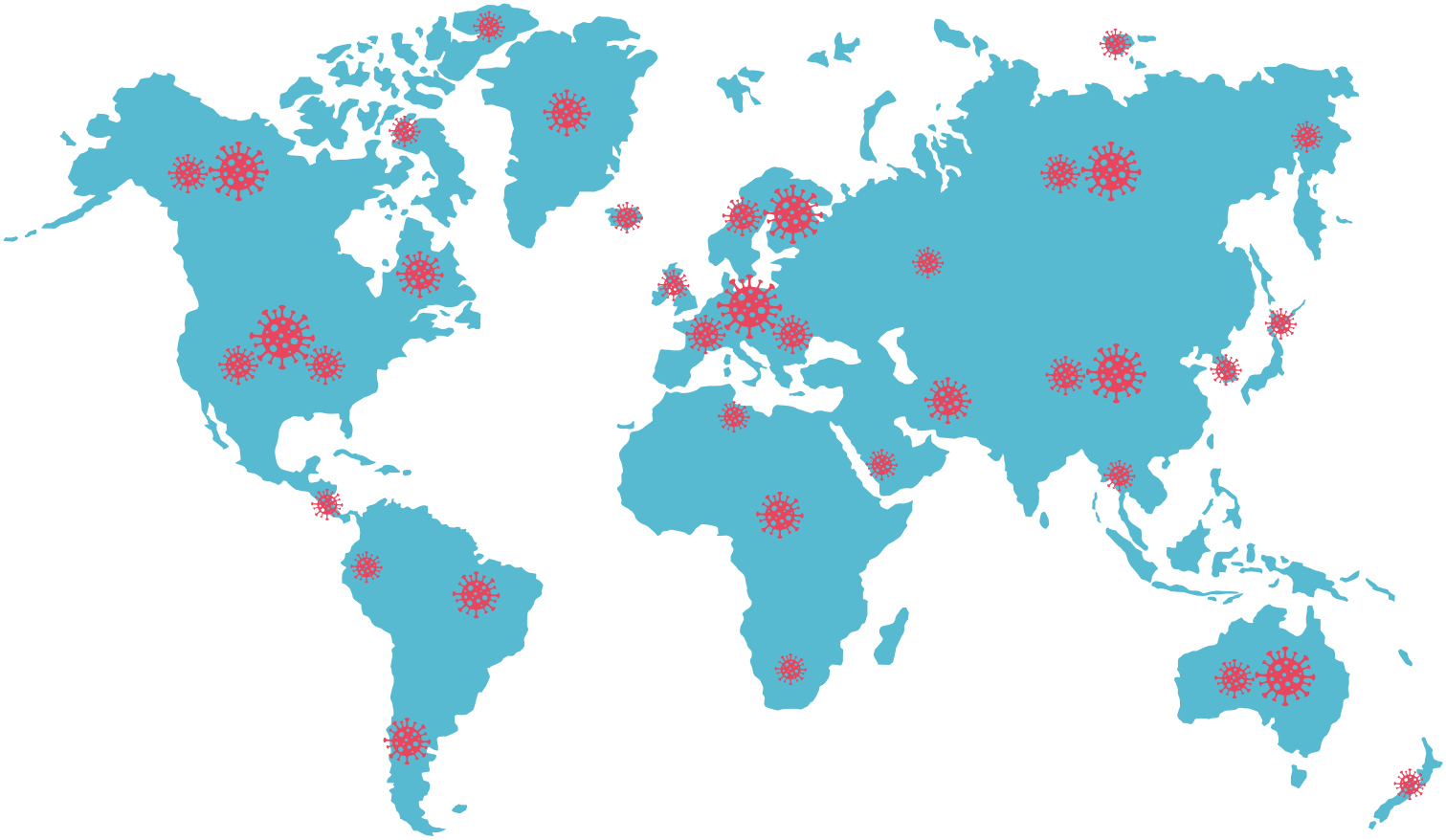
GenScript
Make Research Easy

COVID-19 Research & Diagnostic Solutions

A comprehensive portfolio of off-the-shelf products to speed up SARS-CoV-2 diagnosis, drug discovery and vaccine development.

- SARS-CoV-2 Detection Assays
- Proteins
- Antibodies
- Stable Cell Lines
- Peptide Pools



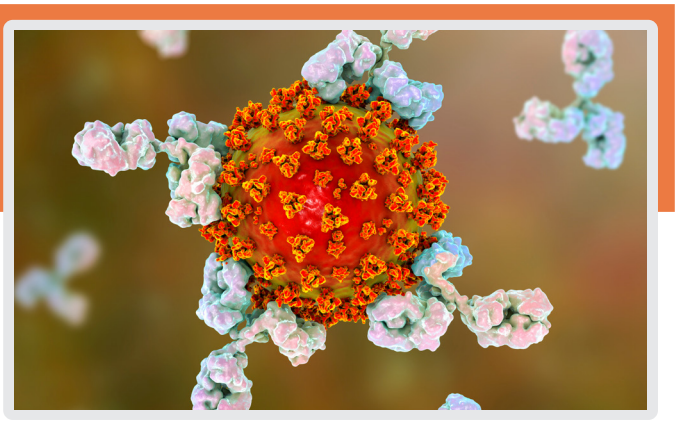
COVID-19 continues to spread around the world, with nearly 200 countries impacted by the deadly pandemic. As new variants of the SARS-CoV-2 virus rapidly emerge, physicians, scientists, and public health officials are urgently trying to understand their mechanisms of action. What is the transmissibility of each strain? Are the currently authorized vaccines effective for the new viral strains?

GenScript,

stands by our heroes in combatting COVID-19. From diagnostics to drug discovery and vaccine development, GenScript has developed a comprehensive range of products that scientists can use to accelerate their COVID-19/SARS-CoV-2 research and development.

DIRECTORY

SARS-CoV-2
Detection Assays



ELISA

cPass™ SARS-CoV-2 Neutralization Antibody Detection Kit ——— Cat # L00847

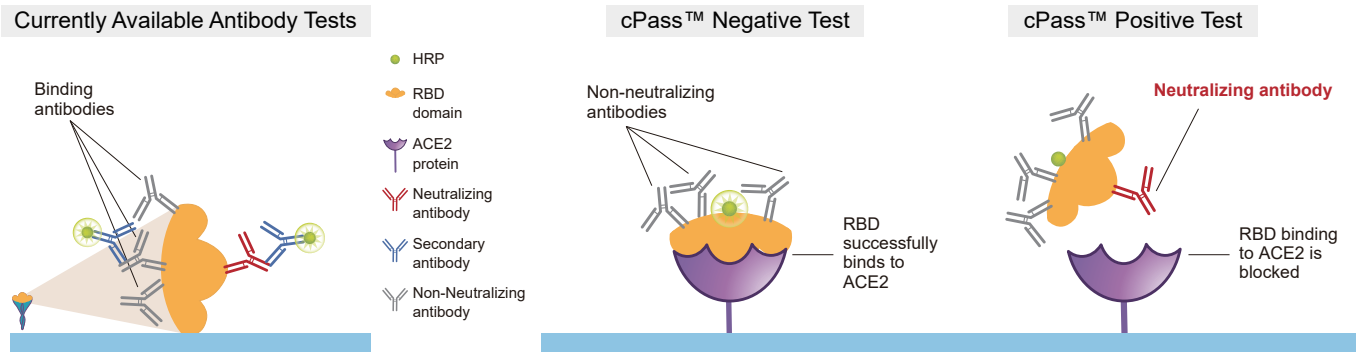
New Updated emergency use authorization from the U.S. FDA includes semi-quantitative reporting of SARS-CoV-2 neutralizing antibodies in individuals showing an adaptive immune response against the SARS-CoV-2 virus due to prior infection. Running the cPass™ test with the newly authorized SARS-CoV-2 Neutralizing Antibody Calibrator (DXC003*), provides a relative concentration (U/mL) of SARS-CoV-2 neutralizing antibody.

Features and Applications

- Isotype-independent.
- High sensitivity and specificity.
- Detection of SARS-CoV-2 neutralizing antibodies in patient serum or plasma.
- Results in approximately 1 hour.

FDA EUA

Product Principle



IgG/IgM ELISA Kit
Detects **all** binding antibodies

cPass™ SARS CoV-2 Neutralization Antibody Detection Kit
Specifically detects **neutralizing** antibodies

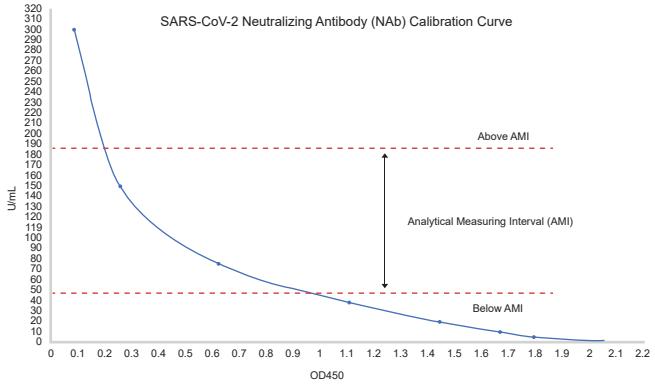
*Emergency use authorization was provided by the FDA for cPass™ SARS-CoV-2 Neutralization Antibody Detection Kit (Cat. No. L00847) on November 12, 2021 for use with SARS-CoV-2 Neutralizing Antibody Standard (Cat. No. A02087; FDA EUA calibrator now available as DXC003) (20 µL) for semi-quantitative detection.

Method for semi-quantitative measurement of SARS-CoV-2 neutralizing antibodies

1. Calculate % Inhibition for all samples

Result	Interpretation
< 30% Inhibition	Negative
≥ 30% Inhibition	Positive

2. Generate calibration curve and analytical measuring interval (AMI) using DXC003



U/mL vs OD450

LL: 47

UL: 185

3. For positive samples with ≥ 30% inhibition, interpolate samples using the calibration curve to obtain U/mL.

OD450	U/mL
0.651	75

4. Report samples that fall within the AMI 47 ≤ X ≥ 185

Calculated % Inhibition	Semi-quantitative calculation (U/mL)	Result
> 30% Inhibition	-	Negative
≥ 30% Inhibition	47 ≤ X ≥ 187	Positive, X U/mL
	< 47 or > 187	Positive, outside AMI range

- This product has not been FDA cleared or approved but has been authorized by FDA under an EUA for use by authorized laboratories;
- This product has been authorized only for detecting the presence of neutralizing antibodies to SARS-CoV-2, not for any other viruses or pathogens;
- The emergency use of this product is only authorized for the duration of the declaration that circumstances exist justifying the authorization of emergency use of in vitro diagnostics for detection and/or diagnosis of COVID-19 under Section 564(b)(1) of the Federal Food, Drug and Cosmetic Act, 21 U.S.C. § 360bbb-3(b)(1), unless the declaration is terminated or authorization is revoked sooner.

SARS-CoV-2 Surrogate Virus Neutralization Test Kit ——— Cat # L00847-A

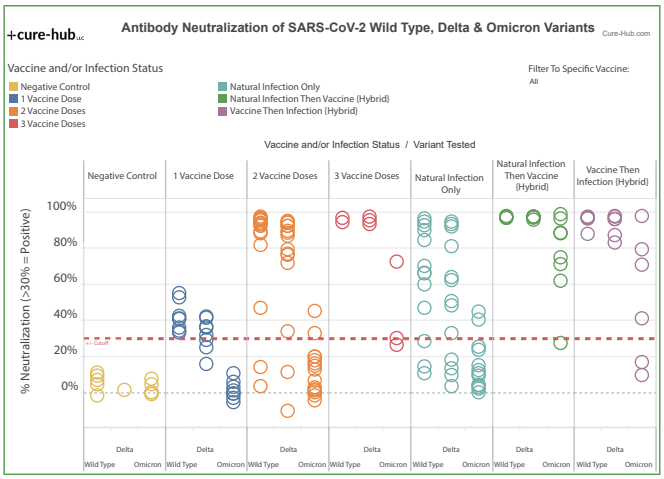
Detect DELTA and OMICRON specific neutralizing antibodies

For Research Use Only. Not for diagnostic procedures.

Features and Applications

- Species-independent
- Isotype-independent
- Detection of SARS-CoV-2 neutralizing antibodies in serum or plasma from recovering COVID-19 and vaccinated patients.
- Results in approximately 1 hour.

Comparison of neutralization across variants by incorporating variant-specific RBD-HRP components.



Data shared with permission from cure-hub.com

Related Products

Cat No.	Description	Application
A02087	SARS-CoV-2 Neutralizing Standard	Generate a calibration curve with known concentrations to calculate semi-quantitative results.
A02161	SARS-CoV-2 (Omicron) Neutralizing Antibody Standard	Calibrate the sVNT kit for Omicron detection as a standard or positive control
Z03614	Delta RBD-HRP	Detection of Delta variant of concern-specific neutralizing antibodies.
Z03730	Omicron RBD-HRP	Detection of Omicron variant of concern-specific neutralizing antibodies.

Rapid Tests

SARS-CoV-2 Neutralizing Antibody Rapid Test[NEW] —— Cat # DXK007

Features and Applications

- Detect SARS-CoV-2 neutralizing antibodies in 15 minutes
- Enhanced qualitative results
- Sample type: blood, serum, or plasma by venipuncture or fingerprick method
- 18 months shelf life

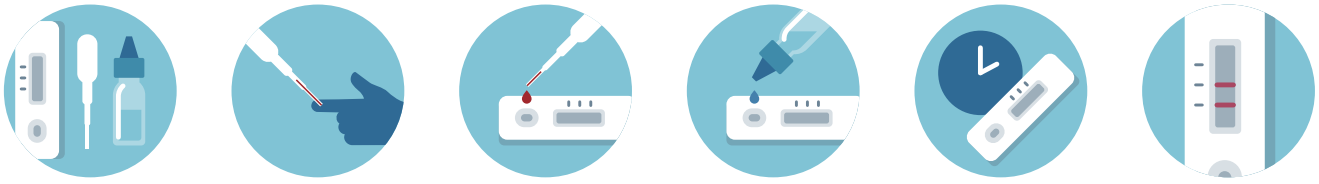
For Research Use Only. Not for diagnostic procedures.

Performance

Samples from a cohort of patients were tested using the SARS-CoV-2 Neutralizing Antibody Rapid Test Kit. The combined cohort consisted of samples from healthy individuals (n= 25) and samples from confirmed SARS-CoV-2 positive patients (n=25) based on plaque reduction neutralization test (PRNT) results.

		Plaque Reduction Neutralization Test (PRNT)	
		Positive (n=25)	Negative (n=25)
SARS-CoV-2 Neutralizing Antibody Rapid Test Kit	Positive	25	1
	Negative	0	24
	Sensitivity	100% (95% CI 86.7-100%)	
	Specificity		96% (95% CI 80.5-99.3%)

Test Procedure



SARS-CoV-2 Antigen Rapid Test[NEW] ——— Cat # DXK004

Features and Applications

- Detect SARS-CoV-2 antigen in 15 minutes
- Qualitative results
- Sample type: nasopharyngeal or oropharyngeal swab
- 12 months shelf life

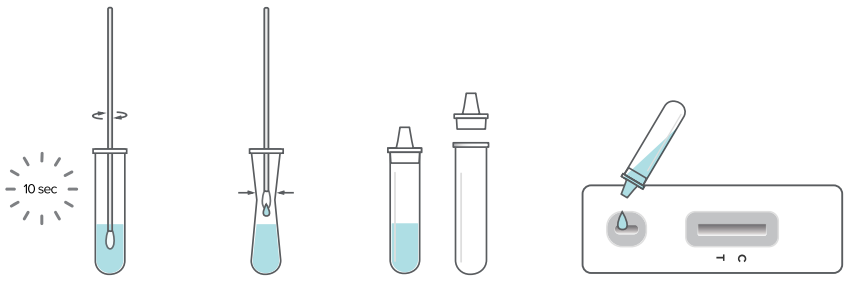
For Research Use Only. Not for diagnostic procedures.

Performance

A research study was performed to compare the performance of the GenScript SARS-CoV-2 Antigen Rapid Test to a current FDA EUA COVID-19 Antigen Rapid Test on the market. Samples (n=60) were purchased from commercial sources and both tests were used to detect the SARS-CoV-2 antigen in each sample.

		COVID-19 Antigen Rapid Test (FDA EUA)	
		Positive (n=15)	Negative (n = 45)
GenScript SARS-CoV-2 Antigen Rapid Test Kit	Positive	15	2
	Negative	0	43
	Positive Percent Agreement	100%	
	Negative Percent Agreement		96%

Test Procedure

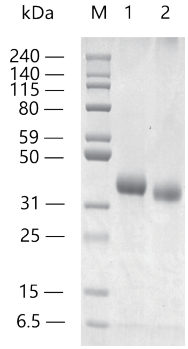


Proteins

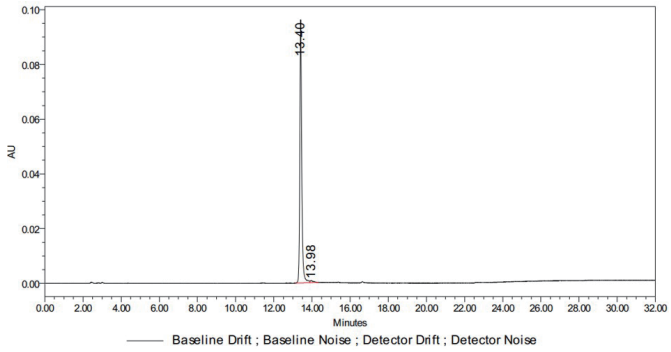
Features and Applications

- Various protein mutations available, variants of concern and more lineages covered.
- Purity and bioactivity validated.
- High lot-to-lot consistency.
- Designed to be used for development of SARS-CoV-2 detection kits, vaccines and therapeutic drugs.

High Purity

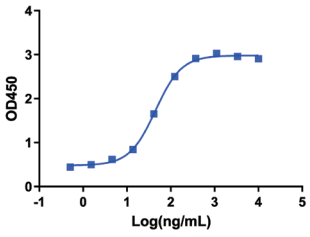


Lane 1: 2μg of SARS-CoV-2 Spike protein (RBD, His & Avi Tag, CHO-expressed) **(Z03512)**, reducing (R).
Lane 2: 2μg of SARS-CoV-2 Spike protein (RBD, His & Avi Tag, CHO-expressed) **(Z03512)**, non-reducing (NR).
The purity was determined to be > 95% as analyzed by SDS-PAGE

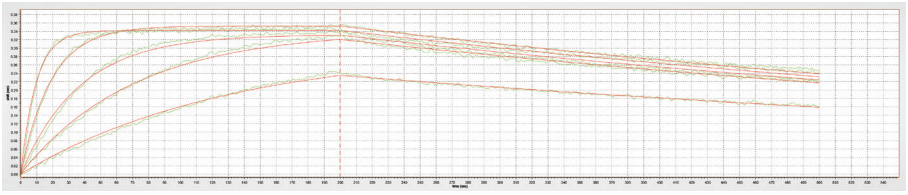


Purity of SARS-CoV-2 Spike protein (RBD, His & Avi tag) **(Z03483)** determined by HPLC-RP was higher than 95%

Biological Activity

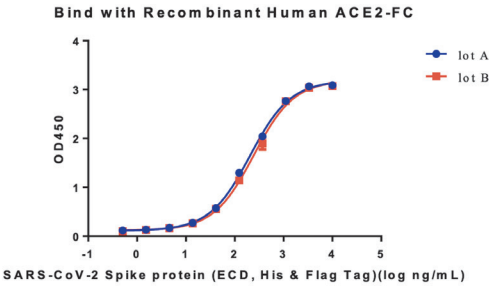


Immobilized ACE-2 Fc Chimera, Human (Cat. No. **Z03484**) at 2 μg/mL can bind with SARS-CoV-2 Spike protein (RBD, E484K, K417N, N501Y, His & Avi Tag) (Cat. No. **Z03537**) with a serial dilution.
THE™ His Tag Antibody [HRP], mAb, Mouse(Cat.No.**A00612**) was used as the secondary antibody(0.2 μg/mL).



Loaded ACE-2 Fc Chimera, Human (CHO-expressed) Protein (Cat. No. **Z03516**) on Protein A Biosensor, can bind SARS-CoV-2 Spike protein (RBD, N501Y, His & Avi Tag) (Cat. No. **Z03533**) with an affinity constant of 2.11 nM as determined in BLI assay.

High lot-to-lot consistency



Immobilized ACE-2 Fc Chimera, Human (Cat. No. **Z03484**) at 2 μg/mL can bind SARS-CoV-2 Spike protein (ECD, His & Flag Tag) (Cat. No. **Z03481**) with a serial dilution.
THE™ His Tag Antibody [HRP], mAb, Mouse(Cat.No.**A00612**) was used as a secondary antibody (0.1 μg/mL).

Product Overview

SARS-CoV-2 Protein Mutations

Type	Variants of Concern					Variants of Interest		
WHO label	Alpha	Beta	Gamma	Delta	Omicron	Epsilon	Kappa	Lambda
Pango lineage	B.1.1.7 (United Kingdom)	B.1.351 (South Africa)	P.1 (Brazil)	B.1.617.2 (India)	B.1.1.529 (South Africa)	B.1.429/7 (US, California)	B.1.617.1 (India)	C.37 (Peru)
S1 Protein	√	√	√	√	√	√	√	√
S-RBD	√	√	√	√	√	√	/	√
S-RBD HRP*	√	√	√	√	√	√	/	√
N Protein	/	/	/	√	√	/	/	/

Check out more spike protein variants on our website: https://www.genscript.com/virus_antigens.html

SARS-CoV-2 Proteins Wild type

N protein	S-ECD	S-RBD / S-RBD HRP*
S1 protein	N & S-RBD Fusion	ACE-2

*S-RBD HRP (wild type) is one of the components in the cPass™ SARS-CoV-2 Neutralization Antibody Test Kit (Cat No. L00847).
To use one of the variant S-RBD HRP products, it is recommended to use the SARS-CoV-2 Surrogate Virus Neutralization Test (sVNT) RUO kit version (Cat No. L00847-A) and use this product as a component replacement for the provided S-RBD-HRP. User can modify and optimize the variant sVNT assay.

Antibodies

Features and Applications

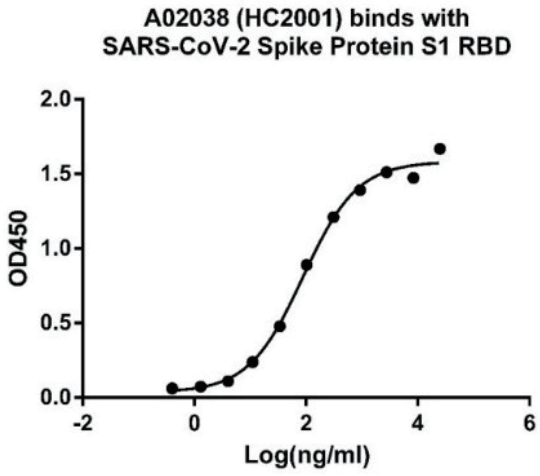
- Validated for ELISA, WB, FACS, and SARS-CoV-2 virus neutralization assay.
- Control antibodies and various antibody pairs available for ELISA-based detection.
- Neutralizing Antibody Standard to calibrate quantitative assay of SARS-CoV-2 neutralizing antibodies in samples.

Recommended Products

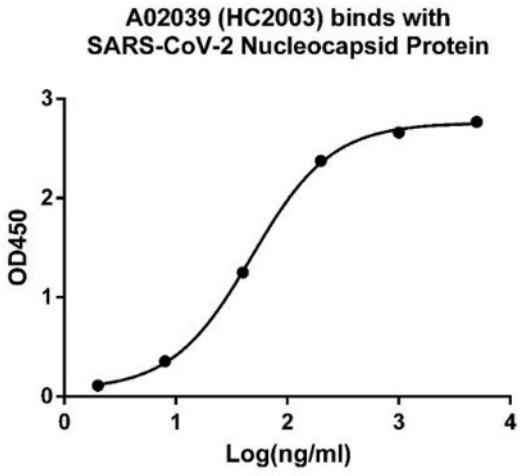
Control antibodies

Positive control antibodies available for detection of different isotypes; validated for use in ELISA assays.

Type	Spike S1 Control Ab	Nucleocapsid Control Ab
Chimeric mAb, IgG	A02038	A02039
Chimeric mAb, IgM	A02046	A02059
Chimeric mAb, IgA	A02071	A02090



SARS-CoV-2 Spike S1 Antibody (HC2001), Human Chimeric (GenScript, **A02038**) was used to bind with recombinant SARS-CoV-2 Spike Protein S1 RBD(**Z03483**) on an ELISA plate. The coating antigen was recombinant SARS-CoV-2 Spike Protein S1 RBD, 0.5 μg/ml. The dilution of SARS-CoV-2 Spike S1 Antibody (HC2001), Human Chimeric (GenScript, **A02038**) started from 25 μg/ml.
EC50= 0.088 μg/ml.

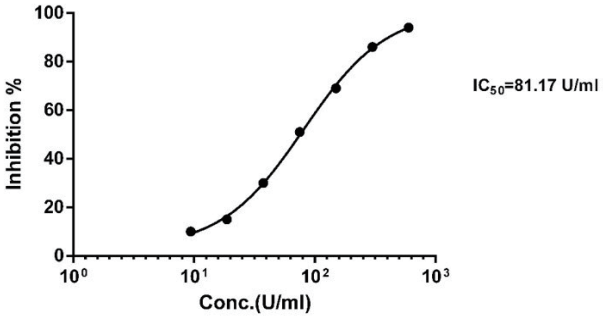


SARS-CoV-2 Nucleocapsid Antibody (HC2003), Human Chimeric (GenScript, **A02039**) was used to bind with recombinant Nucleocapsid Protein (**Z03480**). The coating antigen was recombinant Nucleocapsid Protein, 0.5 μg/ml. The dilution of SARS-CoV-2 Nucleocapsid Antibody (HC2003), Human Chimeric (GenScript, **A02039**) started from 25 μg/ml.
EC50= 0.048 μg/ml.

Neutralizing antibody standard

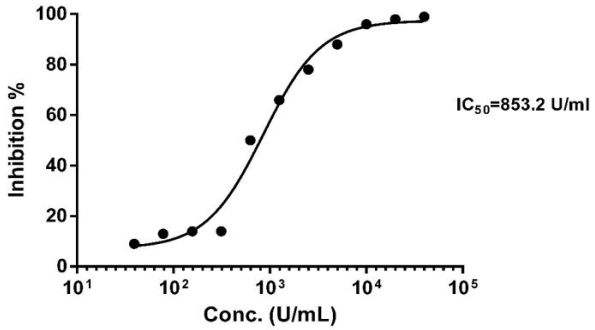
Cat No.	Description	Recommend Applications
A02087	Neutralizing Antibody Standard	Calibrate quantitative assay of SARS-CoV-2 neutralizing antibody (sVNT, PRNT, pVNT)
A02161		Calibrate quantitative assay of SARS-CoV-2 neutralizing antibody (sVNT, PRNT, pVNT) for the Omicron variant

NAb standard (GenScript, A02087) dose response curve on sVNT



Surrogate Virus Neutralization Test of SARS-CoV-2 RBD–hACE2 interaction with the SARS-CoV-2 Neutralizing Antibody Standard (GenScript, **A02087**).
The SARS-CoV-2 Neutralizing Antibody Standard (GenScript, **A02087**) dilutions started from 600 U/ml.
IC50=81.17 U/ml

NAb standard (GenScript, A02087) dose response curve on PVNT

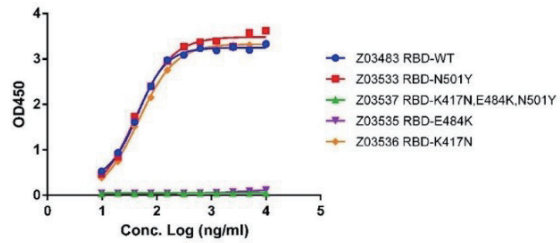


Pseudovirus Neutralization Test of SARS-CoV-2 pseudovirus–hACE2 interaction with the SARS-CoV-2 Neutralizing Antibody Standard (GenScript, **A02087**).
Control: HEK293/ACE2 cells infected with SARS-CoV-2 pseudovirus.
The SARS-CoV-2 Neutralizing Antibody Standard (GenScript, **A02087**) dilutions started from 40,000 U/ml.
IC_{50}= 853.2 U/ml

Site specific Neutralizing antibodies

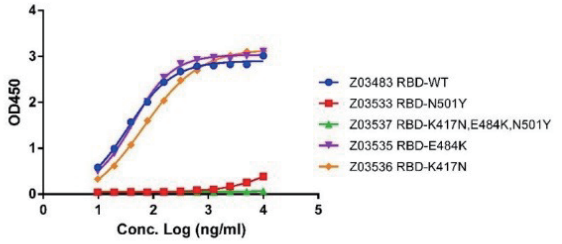
Cat No.	Specific Site	Application Note
A02109	E484	Not recognize E484 mutant
A02110	N501	Not recognize N501 mutant
A02140	417N	Recognize 417N mutant
A02154	452R	Recognize 452R mutant
A02155	484Q	Recognize 484Q mutant

SARS-CoV-2 Spike (E484) NAb (COV2109) binds with wild-type SARS-CoV-2 S1-RBD and RBD mutants



ELISA binding of the SARS-CoV-2 Spike (E484) Neutralizing Antibody (COV2109) (GenScript, **A02109**) with wild-type SARS-CoV-2 S1-RBD and SARS-CoV-2 S1-RBD mutants.
Coating antigen: wild-type SARS-CoV-2 S1-RBD and SARS-CoV-2 S1-RBD mutants, 2 μg/ml.
The dilution of SARS-CoV-2 Spike (E484) Neutralizing Antibody (COV2109) (GenScript, **A02109**) started from 10 μg/ml.

SARS-CoV-2 Spike (N501) NAb (COV2110) binds with wild-type SARS-CoV-2 S1-RBD and RBD mutants



ELISA binding of SARS-CoV-2 Spike (N501) Neutralizing Antibody (COV2110) (GenScript, **A02110**) with wild-type SARS-CoV-2 S1-RBD and SARS-CoV-2 S1-RBD mutants.
Coating antigen: wild-type SARS-CoV-2 S1-RBD and SARS-CoV-2 S1-RBD mutants, 2 μg/ml.
The dilution of SARS-CoV-2 Spike (N501) Neutralizing Antibody (COV2110) (GenScript, **A02110**) started from 10 μg/ml.

Stable Cell Lines

Features

- Single clone derived cell line catalog products.
- Overexpression of target protein validated by flow cytometry.
- Quick response and fast delivery.

Product Portfolio

ACE2 Expressing Cell lines

GenScript offers Angiotensin-Converting Enzyme 2 (ACE2) expressed CHO-K1 or HEK293 cell line product for drug discovery on blocking receptor binding domain (RBD) and ACE2 recognition and binding. ACE2 expressing HEK293 cell line is capable for SARS-CoV-2 pseudovirus neutralization assay.

Cat No.	Product Name	Applications
M00770	HEK293/ACE2 Stable cell line	• Cell-based binding assay • Cell-based neutralization assay • SARS-CoV-2 pseudovirus neutralization assay (HEK293/ACE2)
M00771	CHO-K1/ACE2 Stable cell line	

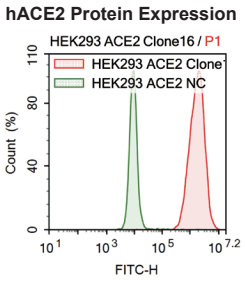


Figure 1: FACS analysis of ACE2 expression in HEK293/ACE2 cells.
HEK293/ACE2 cells (GenScript, M00770) were plated at 3x105 cells per well in 100 µl PBS in 96-well plate, incubated with 10 µg/ml S-RBD-His (GenScript, Z03479) on ice for 1 hour, and the negative control left untreated. Both groups were incubated with Anti-His 2nd antibody (GenScript, A01800) and then analyzed on flow cytometer.

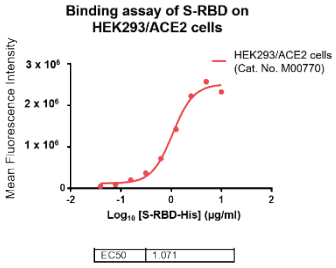


Figure 2: HEK293/ACE2 cells based binding assay.
HEK293/ACE2 cells were plated in 96-well plate, incubated with S-RBD-His (GenScript, Z03479) in serial dilutions. Then incubated with Anti-His 2nd antibody (GenScript, A01800), and later analyzed on flow cytometer. FACS analysis shows HEK293/ACE2 cells binds S-RBD at EC50 = 1.071 µg/ml.

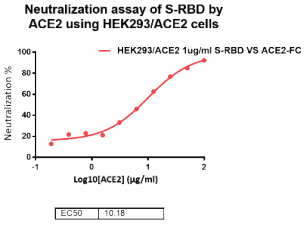


Figure 3: HEK293/ACE2 cells based neutralization assay.
HEK293/ACE2 cells were plated in 96-well plate, incubated with S-RBD-His (GenScript, Z03479) and ACE-Fc (GenScript, Z03484) in serial dilutions. Then incubated with Anti-His 2nd antibody (GenScript, A01800), and later analyzed on flow cytometer. FACS analysis shows HEK293/ACE2 cells binds S-RBD at EC50 = 1.071 µg/ml.

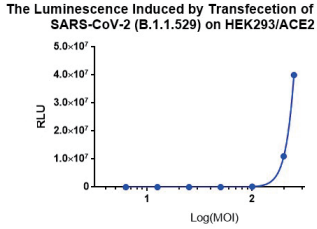


Figure 4: SARS-CoV-2 (B.1.1.529) pseudovirus transfection on ACE2 overexpression HEK293 cells.
SARS-CoV-2 pseudovirus with S glycoprotein as the envelope protein. The pseudovirus entry was initiated by recognition and binding between RBD and ACE2 on HEK293 cells.

Spike Protein (WT) expressing cell lines

GenScript offers full-length spike protein expressed CHO-K1 or HEK293T cell line product for drug discovery and spike protein related basic research.

Cat No.	Product Name	Applications
M00803	CHO-K1/Spike Stable cell line	• Cell-based binding assays • Use as immunogen
M00804	HEK293T/Spike Stable cell line	

Peptide Pools

Features and Applications

- The SARS-CoV-2 overlapping peptides mixture includes both structural and non-structural proteins.
- The Spike Glycoprotein peptide pool has >90% purity.
- The peptide pools are ready to be used for stimulation of T cells during ELISPOT and other T cell assays.

Product Overview

Spike Glycoprotein B.1.1.529-Omicron	Spike Glycoprotein RBD B.1.617.2-Delta	Membrane protein	ORF7b
Spike Glycoprotein B.1.1.7 -Alpha	HCoV-229E Spike Glycoprotein	Nucleoprotein	ORF8
Spike Glycoprotein RBD B.1.1.7-Alpha	HCoV-OC43 Spike glycoprotein	ORF3a	ORF9B
Spike Glycoprotein RBD P.1-Gamma	Spike Glycoprotein	ORF6	ORF10
Spike Glycoprotein B.1.617.2-Delta	Envelope small membrane protein	ORF7a	Uncharacterized protein 14

Contact your local sales manager for details and information about upcoming products.


Thank You
Thank You
FRONTLINERS
POLICE
BUS DRIVER
MILK
BREAD
FRESH BAKED
JAM

www.GenScript.com

GenScript USA Inc.
860 Centennial Ave.
Piscataway, NJ 08854 USA

Email: product@genscript.com
Phone: 1-732-885-9188
Toll-Free: 1-877-436-7274
Fax: 1-732-518-5150