abcam

ab273433

Anti-SARS spike glycoprotein antibody [1A9]

Key facts

Isotype	IgG1
Host species	Mouse
Storage buffer	pH: 7.4 Constituents: PBS
Form	Liquid
Clonality	Monoclonal
Carrier free	Yes
Clone number	1A9
Purification technique	Affinity purification Protein G
Concentration	1 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

ICC/IF

Tested

Species	SARS-CoV-2
Dilution info	1/100 - 1/2000
Notes	-

Expected

Species	SARS-CoV
Dilution info	Use at an assay dependent concentration.
Notes	-

Not recommended

Species	Recombinant fragment - SARS-CoV-2
Dilution info	-
Notes	-

IP

Tested

Species	SARS-CoV-2
Dilution info	-
Notes	-

Expected

Species	SARS-CoV
Dilution info	Use at an assay dependent concentration.
Notes	-

Not recommended

Species	Recombinant fragment - SARS-CoV-2
Dilution info	-
Notes	-

Flow Cyt

Tested

Species	SARS-CoV-2
Dilution info	-

Notes	-

Expected

Species	SARS-CoV
Dilution info	Use at an assay dependent concentration.
Notes	-

Not recommended

Species	Recombinant fragment - SARS-CoV-2
Dilution info	-
Notes	-

WB

Tested

Species	SARS-CoV-2
Dilution info	1/500 - 1/3000
Notes	-

Species	SARS-CoV
Dilution info	1/500 - 1/3000
Notes	-

Not recommended

Species	Recombinant fragment - SARS-CoV-2
Dilution info	-
Notes	-

sELISA

Tested

Species	Recombinant fragment - SARS-CoV-2

Dilution info	5 µg/mL
Notes	Can be used as Capture antibody when paired with ab281312.

Expected

Species	SARS-CoV-2, SARS-CoV
Dilution info	Use at an assay dependent concentration.
Notes	-

Target data

See full target information S

Function

Spike protein S1. Attaches the virion to the cell membrane by interacting with host receptor, initiating the infection. The major receptor is host ACE2 (PubMed:32142651, PubMed:32155444, PubMed:33607086). When S2/S2' has been cleaved, binding to the receptor triggers direct fusion at the cell membrane (PubMed:34561887). When S2/S2' has not been cleaved, binding to the receptor results in internalization of the virus by endocytosis using host TFRC and GRM2 and leading to fusion of the virion membrane with the host endosomal membrane (PubMed:32075877, PubMed:32221306, PubMed:34903715, PubMed:36779763). Alternatively, may use NRP1/NRP2 (PubMed:33082294, PubMed:33082293) and integrin as entry receptors (PubMed:35150743). The use of NRP1/NRP2 receptors may explain the tropism of the virus in human olfactory epithelial cells, which express these molecules at high levels but ACE2 at low levels (PubMed:33082293). Uses also ASGR1 as an alternative receptor in an ACE2-independent manner (PubMed:34837059). The stalk domain of S contains three hinges, giving the head unexpected orientational freedom (PubMed:32817270). Spike protein S2. Precursor of the fusion protein processed in the biosynthesis of the S protein and the formation of virus particle. Mediates fusion of the virion and cellular membranes by functioning as a class I viral fusion protein. Contains two viral fusion peptides that are unmasked after cleavage. The S2/S2' cleavage occurs during virus entry at the cell membrane by host TMPRSS2 (PubMed:32142651) or during endocytosis by host CSTL (PubMed:32703818, PubMed:34159616). In either case, this triggers an extensive and irreversible conformational change leading to fusion of the viral envelope with the cellular cytoplasmic membrane, releasing viral genomic RNA into the host cell cytoplasm (PubMed:34561887). Under the current model, the protein has at least three conformational states: pre-fusion native state, pre-hairpin intermediate state, and post-fusion hairpin state. During fusion of the viral and target cell membranes, the coiled coil regions (heptad repeats) adopt a trimer-of-hairpins structure and position the fusion peptide in close proximity to the C-terminal region of the ectodomain. Formation of this structure appears to promote apposition and subsequent fusion of viral and target cell membranes. Spike protein S2'. Subunit of the fusion protein that is processed upon entry into the host cell. Mediates fusion of the virion and cellular membranes by functioning as a class I viral fusion protein. Contains a viral fusion peptide that is unmasked after S2 cleavage. This cleavage can occur at the cell membrane by host TMPRSS2 or during endocytosis by host CSTL (PubMed:32703818, PubMed:34159616). In either

case, this triggers an extensive and irreversible conformational change that leads to fusion of the viral envelope with the cellular cytoplasmic membrane, releasing viral genomic RNA into the host cell cytoplasm (PubMed:34561887). Under the current model, the protein has at least three conformational states: pre-fusion native state, pre-hairpin intermediate state, and post-fusion hairpin state. During fusion of the viral and target cell membranes, the coiled coil regions (heptad repeats) adopt a trimer-of-hairpins structure and position the fusion peptide in close proximity to the C-terminal region of the ectodomain. Formation of this structure appears to promote apposition and subsequent fusion of viral and target cell membranes.

Storage

Shipped at conditions	Blue Ice
Appropriate short-term storage duration	1-2 weeks
Appropriate short-term storage conditions	+4°C
Appropriate long-term storage conditions	-20°C
Aliquoting information	Upon delivery aliquot
Storage information	Avoid freeze / thaw cycle

Notes

Applications overview

Tick: Tested and Guaranteed to work X: Will not work —: No data

<img src="https://www.abcam.com/ps/Products/273/ab273433/Images/ab273433-394126-applications-overview.jpg" height="125" width="678">

Supplementary info

This supplementary information is collated from multiple sources and compiled automatically.

Activity summary	The SARS spike glycoprotein also known as the S glycoprotein is a critical component of the SARS-CoV-2 virus. It weighs approximately 180 kDa and can be found on the surface of the viral envelope. The spike glycoprotein facilitates the entry of the virus into host cells by binding to the angiotensin-converting enzyme 2 (ACE2) receptor. This protein is often targeted by monoclonal antibodies and vaccine strategies aimed at preventing infection. Researchers isolate antibodies

	that bind specifically to the spike contributing to the development of therapeutic agents like anti-spike monoclonal antibodies.
Biological function summary	The spike glycoprotein serves a fundamental role in the viral life cycle by mediating fusion between the viral membrane and host cell membranes. Its function is divided into two subunits: S1 which is responsible for receptor binding and S2 which is important for membrane fusion. Upon receptor binding a conformational change in the glycoprotein occurs triggering fusion events critical for viral entry. This protein is not typically part of a larger complex but operates in tandem with viral envelope proteins to facilitate replication.
Pathways	The spike glycoprotein's interaction with the host cell's ACE2 receptor places it within the renin-angiotensin-aldosterone system (RAAS) affecting several downstream signaling pathways. The binding initiates endocytosis of the virus into the host cell and impacts inflammation pathways and immune response mechanisms involving interleukin proteins. The spike protein shares functional relationships with other viral proteins such as nucleocapsid and membrane proteins contributing to the virion's structure and infection process.
Associated diseases and disorders	The spike glycoprotein is closely associated with COVID-19 and the disease's ability to spread and mutate. It's a central focus in the development of potential treatments and vaccines given its role in viral entry. Some mutations in the spike protein can enhance transmissibility or resistance to neutralization influencing the course of infection. In seeking therapeutic interventions researchers focus on spike-related interactions with host proteins like ACE2 which are important in managing COVID-19 symptoms and complications.

Product promise

Tested

We have tested this species and application combination and it works. It is covered by our product promise.

Expected

We have not tested this specific species and application combination in-house, but expect it will work. It is covered by our product promise.

Predicted

This species and application combination has not been tested, but we predict it will work based on strong homology. However, this combination is not covered by our product promise.

Not recommended

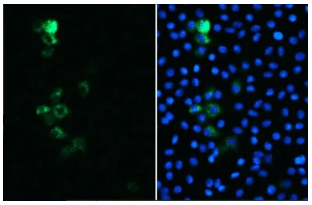
We do not recommend this combination. It is not covered by our product promise.

We are dedicated to supporting your work with high quality reagents and we are here for you every step of the way should you need us.

In the unlikely event of one of our products not working as expected, you are covered by our product promise.

Full details and terms and conditions can be found here:
Terms & Conditions.

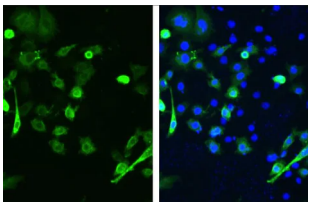
9 product images



Immunocytochemistry/ Immunofluorescence - Anti-SARS spike glycoprotein antibody [1A9] (ab273433)

SARS spike glycoprotein Immunocytochemistry/ Immunofluorescence staining using mouse Anti-SARS spike glycoprotein antibody

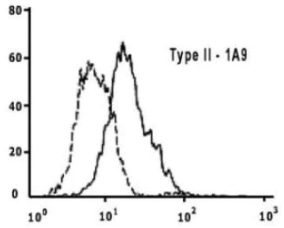
Methanol-fixed Vero E6 cells infected with SARS-CoV-2 (MOI of 1) stained for SARS-CoV-2 (green) using ab273433 at 1/2000 dilution in ICC. Counterstained with DAPI (Blue).



Immunocytochemistry/ Immunofluorescence - Anti-SARS spike glycoprotein antibody [1A9] (ab273433)

SARS spike glycoprotein Immunocytochemistry/ Immunofluorescence staining using mouse Anti-SARS spike glycoprotein antibody

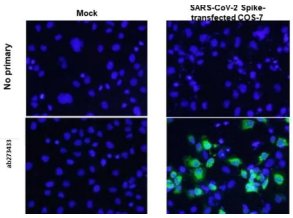
4% paraformaldehyde-fixed BHK-21 cells stained for SARS-CoV-2 (COVID-19) spike (green) using ab273433 at 1/2000 dilution in ICC.



Flow Cytometry - Anti-SARS spike glycoprotein antibody [1A9] (ab273433)

SARS spike glycoprotein Flow Cytometry staining using mouse Anti-SARS spike glycoprotein antibody

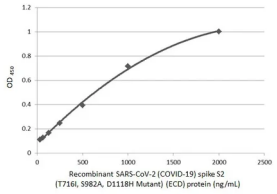
Flow cytometric analysis of HEK-293T cells infected with recombinant vaccinia virus carrying the spike gene, using ab273433.



Immunocytochemistry/ Immunofluorescence - Anti-SARS spike glycoprotein antibody [1A9] (ab273433)

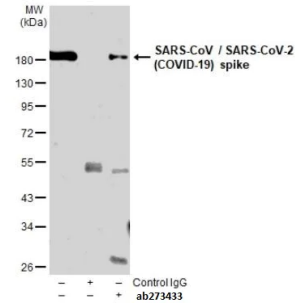
SARS spike glycoprotein Immunocytochemistry/ Immunofluorescence staining using mouse Anti-SARS spike glycoprotein antibody

Mock and SARS-CoV-2-transfected COS-7 cells stained for SARS-CoV-2 (COVID-19) spike (green) using ab273433 at 1/2000 dilution in ICC. Nuclei were counterstained with DAPI (Blue).



Sandwich ELISA - Anti-SARS spike glycoprotein antibody [1A9] (ab273433)

Sandwich ELISA detection of recombinant SARS-CoV-2 (COVID-19) Spike S2 (T716I, S982A, D1118H Mutant) (ECD) protein, His tag using SARS-CoV / SARS-CoV-2 (COVID-19) spike antibody [1A9] (ab273433) as capture antibody at concentration of 5 µg/mL and SARS-CoV-2 (COVID-19) Spike S2 antibody [HL237] (ab281312) as detection antibody at concentration of 1 µg/mL. A Rabbit IgG antibody (HRP) conjugated was diluted at 1:10000 and used to detect the primary antibody.



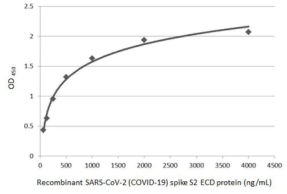
Immunoprecipitation - Anti-SARS spike glycoprotein antibody [1A9] (ab273433)

SARS-CoV-2 Spike was immunoprecipitated from 2µg of HEK-293T whole cell lysate with ab273433. Western blot was performed from the immunoprecipitate using ab273433. EasyBlot HRP-conjugated anti mouse IgG antibody.

Lane 1: HEK-293T lysate 2 µg (Input).
Lane 2: Control IgG IP in HEK-293T lysate.
Lane 3: ab273433 IP in HEK-293T lysate.

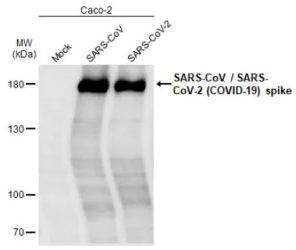
All lanes:
Immunoprecipitation - Anti-SARS spike glycoprotein antibody [1A9] (ab273433)

Predicted band size: 139 kDa



Sandwich ELISA - Anti-SARS spike glycoprotein antibody [1A9] (ab273433)

Sandwich ELISA detection of SARS spike glycoprotein using ab273433 as the capture antibody at 5 µg/mL. An alternative antibody was used as the detection antibody at 1 µg/mL followed by a Rabbit IgG antibody (HRP) at 1/10000 to detect the primary antibody.



Western blot - Anti-SARS spike glycoprotein antibody [1A9] (ab273433)

Lane 1:
Western blot - Anti-SARS spike glycoprotein antibody [1A9] (ab273433)

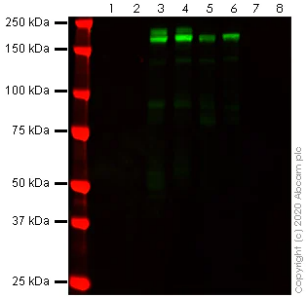
Lanes 2 - 3:
Western blot - Anti-SARS spike glycoprotein antibody [1A9] (ab273433) at 1/1000 dilution

Lane 1:
Mock

Lane 2:
SARS-CoV infected Caco-2 whole cell extract

Lane 3:
SARS-CoV-2 infected Caco-2 whole cell extract

Predicted band size: 139 kDa



Western blot - Anti-SARS spike glycoprotein antibody [1A9] (ab273433)

Lanes 1 - 8: Merged signal (red and green). Green - ab273433 observed at 200 kDa. Red - loading control.
ab273433 was shown to react with SARS spike glycoprotein in western blot. Membranes were blocked in 3% milk before incubation with ab273433 overnight at 4°C at 1 ug/ml. Blots were incubated with Donkey anti-Mouse IgG H&L(IRDye® 800CW) preabsorbed (ab216774) antibody at 1 in 20000 dilution for 1 hour at room temperature before imaging.

All lanes:
Western blot - Anti-SARS spike glycoprotein antibody [1A9] (ab273433) at 1 µg/mL

Lane 1:
Mock transfected human Expi cell lysate at 10 µg

Lane 2:
PDL-1 Flag transfected human Expi cell lysate at 10 µg

Lane 3:
SARS-Cov1 spike protein transfected human Expi cell lysate at 10 µg

Lane 4:
SARS-Cov1 3xFlag spike protein transfected human Expi cell lysate at 10 µg

Lane 5:
SARS-Cov2 spike protein transfected human Expi cell lysate at 10 µg

Lane 6:
SARS-Cov2 3xFlag spike protein transfected human Expi cell lysate at 10 µg

Lane 7:
MERS Spike protein transfected human Expi cell lysate at 10 µg

Lane 8:
MERS 3xFlag Spike protein transfected human Expi cell lysate at 10 µg

Performed under reducing conditions.

Predicted band size: 139 kDa

Observed band size: 200 kDa

Please note: All products are 'FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC OR THERAPEUTIC PROCEDURES'.