abcam

ab283943

# Anti-SARS-CoV-2 Spike Glycoprotein S1 antibody [EPR24852-116] - BSA and Azide free

Recombinant | RabMAb

## Key facts

| | |
|---|---|
| **Isotype** | IgG |
| **Host species** | Rabbit |
| **Storage buffer** | Constituents: PBS |
| **Form** | Liquid |
| **Clonality** | Monoclonal |
| **Immunogen** | The exact immunogen used to generate this antibody is proprietary information. |
| **Carrier free** | Yes |
| **Clone number** | EPR24852-116 |
| **Purification technique** | Affinity purification Protein A |
| **Specificity** | Our data (not shown) suggests this RabMAb is interacting with the non-receptor binding domain of SARS-CoV-2 Spike Glycoprotein S1 with a higher affinity (~ 71x ) than the receptor binding domain of SARS-CoV-2 Spike Glycoprotein S1.<br>This antibody cross-reacts with the SARS-CoV-2 Omicron variant spike protein. |
| **Concentration** | 1 mg/mL The concentration of this product may be batch-dependent<br>Batch concentration finder → |

## Reactivity data

## Dot

**Tested**

| | |
|---|---|
| **Species** | SARS-CoV-2 |
| **Dilution info** | - |
| **Notes** | - |

## ELISA

**Tested**

| | |
|---|---|
| **Species** | SARS-CoV-2 |
| **Dilution info** | - |
| **Notes** | - |

## WB

**Tested**

| | |
|---|---|
| **Species** | SARS-CoV-2 |
| **Dilution info** | - |
| **Notes** | - |

## ICC/IF

**Tested**

| | |
|---|---|
| **Species** | SARS-CoV-2 |
| **Dilution info** | - |
| **Notes** | - |

## Flow Cyt

**Tested**

| | |
|---|---|
| **Species** | SARS-CoV-2 |
| **Dilution info** | - |
| **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 conditions** | +4°C |
| **Appropriate long-term storage conditions** | +4°C |

## Notes

ab283943 is the carrier-free version of ab283942

**Patented technology**
Our RabMAb® technology is a patented hybridoma-based technology for making rabbit monoclonal antibodies. For details on our patents, please refer to RabMAb® patents.

**What are the advantages of a recombinant monoclonal antibody?**
This product is a recombinant monoclonal antibody, which offers several advantages including:

- High batch-to-batch consistency and reproducibility
- Improved sensitivity and specificity
- Long-term security of supply
- Animal-free batch production

For more information, read more on recombinant antibodies.

**Conjugation ready**
Our carrier-free antibodies are typically supplied in a PBS-only formulation, purified and free of BSA, sodium azide and glycerol. This conjugation-ready format is designed for use with fluorochromes, metal isotopes, oligonucleotides, and enzymes, which makes them ideal for antibody labelling, functional and cell-based assays, flow-based assays (e.g. mass cytometry) and Multiplex Imaging applications.

Use our conjugation kits for antibody conjugates that are ready-to-use in as little as 20 minutes with 1 minute hands-on-time and 100% antibody recovery: available for fluorescent dyes, HRP, biotin and gold.

**Compatibility**
This product is compatible with the Maxpar® Antibody Labeling Kit from Fluidigm, without the need for antibody preparation. Maxpar® is a trademark of Fluidigm Canada Inc.

## Supplementary info

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

| | |
|---|---|
| **Activity summary** | The SARS-CoV-2 Spike Glycoprotein S1 also known as the G10 spike or glycoprotein spike plays an important role in allowing the virus to attach and enter host cells. This protein with a mass of approximately 180 kDa is located on the surface of the virus and forms the outer spikes observed in coronaviruses. Expression of the spike glycoprotein is in virus-infected cells where it facilitates the interaction with host cell receptors. The S1 subunit includes a receptor-binding domain that specifically binds to the human angiotensin-converting enzyme 2 (ACE2) receptors initiating the infection process. |

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|---|---|
| **Biological function summary** | The spike glycoprotein S1 mediates the fusion of the viral and cellular membranes which is necessary for viral entry. It forms part of a larger trimeric complex comprising S1 and S2 subunits. This complex undergoes conformational changes that drive the membrane fusion process. The glycoprotein contains multiple glycosylation sites which help shield the virus from the host immune response. The proper function and presentation of this glycoprotein are critical for efficient viral spread and infection establishment. |
| **Pathways** | The spike glycoprotein S1 is integral to the viral infection pathway and host immune evasion. It interacts with the renin-angiotensin system by binding to the ACE2 receptor disrupting normal receptor activity. This interaction not only facilitates viral entry but also impacts the homeostatic functions typically mediated by ACE2 which include blood pressure regulation. Additionally the spike protein is involved in downstream activation of immune signaling pathways including those related to inflammation and cytokine production which may involve proteins such as IL-6. |
| **Associated diseases and disorders** | Infection with the spike glycoprotein S1 is directly related to COVID-19. The binding to ACE2 receptors is linked to the pathology of the disease contributing to respiratory symptoms and in severe cases acute respiratory distress syndrome (ARDS). Through the IL-6 signaling pathway the spike protein is indirectly connected to cytokine release syndrome often observed in severe COVID-19 cases. This connection highlights the importance of targeting this glycoprotein for potential therapeutic interventions and diagnostics such as ELISA SARS-CoV-2 tests and the development of anti-spike antibodies available on platforms like antispark.com for research and clinical purposes. |

## 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.

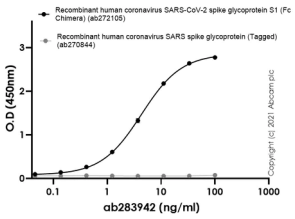
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We are dedicated to supporting your work with high quality reagents and we are here for you every step of the way should you need us.

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.

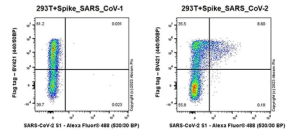
## 5 product images




### ELISA - Anti-SARS-CoV-2 Spike Glycoprotein S1 antibody [EPR24852-116] - BSA and Azide free (ab283943)

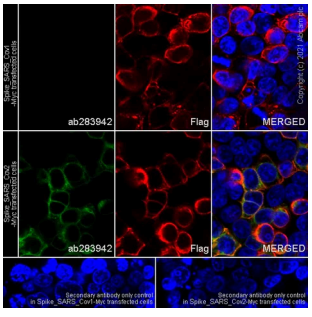
This data was developed using ab283942, the same antibody clone in a different buffer formulation.
Indirect ELISA showing primary antibody ab283942 binding to the antigen ab272105 (recombinant human coronavirus SARS-CoV-2 spike glycoprotein S1 (Fc Chimera)). Plates were coated with recombinant human coronavirus SARS-CoV-2 spike glycoprotein S1 (Fc Chimera, ab272105) and recombinant human coronavirus SARS spike glycoprotein (Tagged, ab270844) at 1000 ng/ml. Binding of ab283942 was assessed in a serial dilution range 0.04- 100 ng/mL (a 3-fold serial dilution).

Binding was detected using pre-adsorbed secondary antibody, goat anti-rabbit IgG H&L (HRP, ab97080) at 1/2000 dilution.



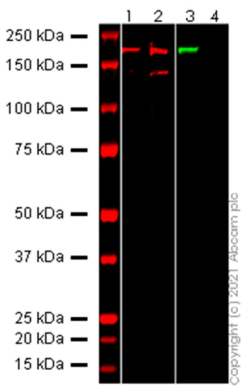

### Flow Cytometry - Anti-SARS-CoV-2 Spike Glycoprotein S1 antibody [EPR24852-116] - BSA and Azide free (ab283943)

This data was developed using ab283942, the same antibody clone in a different buffer formulation. Flow Cytometry analysis of HEK-293T (Human embryonic kidney epithelial cell) cells transfected with a Spike SARS-CoV-1 (Left) or Spike SARS-CoV-2 (Right) expression vector labeling SARS-CoV-2 Spike Glycoprotein S1 with ab283942 at 1/500 dilution followed by ab150081 AlexaFluor®488 Goat anti-Rabbit secondary (green) at 1/2000 dilution. Cells were fixed with 2% Paraformaldehyde and permeabilised with 0.1% Tween-20. Cells were surface stained with ab283942. Then fixed with 2% PFA for 10min followed by intracellularly stained with anti-Flag tag conjugated to BV421. No cross-reactivity with Spike SARS-CoV-1.




### Immunocytochemistry/ Immunofluorescence - Anti-SARS-CoV-2 Spike Glycoprotein S1 antibody [EPR24852-116] - BSA and Azide free (ab283943)

This data was developed using ab283942, the same antibody clone in a different buffer formulation. Immunocytochemistry/ Immunofluorescence analysis of HEK-293T transfected with a Spike-SARS-CoV2 expression vector labeling SARS-CoV-2 Spike Glycoprotein S1 with ab283942 at 1/500 dilution followed by ab150081 AlexaFluor®488 Goat anti-Rabbit secondary (green) at 1/1000 dilution. The counterstain was Anti-FLAG mouse monoclonal antibody at 1/500 dilution followed by ab150120 AlexaFluor®594 Goat anti-Mouse secondary(red) at 1/1000 dilution. Cells were fixed with 100% methanol and permeabilised with 0.1% TritonX-100. Nuclear counterstain was DAPI. Confocal image showing the antibody co-stain with Flag in HEK-293T cells transfected with a Spike-SARS-CoV2 expression vector containing a flag tag. Image was taken with a confocal microscope (Leica-Microsystems, TCS SP8).




## Western blot - Anti-SARS-CoV-2 Spike Glycoprotein S1 antibody [EPR24852-116] - BSA and Azide free (ab283943)

This data was developed using ab283942, the same antibody clone in a different buffer formulation.
**Observed band size:** 200 kDa

**Calculated:** 140kDa

**Secondaries**

**Lane 1 & 2:** Red – loading control Goat anti-DDDDK tag antibody (ab95045, Binds to FLAG tag sequence) observed at 200 kDa

**Lanes 3 & 4:** Green – ab283942 observed at 200 kDa

ab283942 was shown to bind specifically to SARS-CoV-2 spike glycoprotein S1 in Western blot. Samples were run on an SDS-PAGE gel then transferred onto a nitrocellulose membrane. Membranes were blocked in 3 % milk in TBS-0.1 % Tween® 20 (TBS-T) before incubation with primary antibodies overnight at 4 °C. Blots were washed four times in TBS-T, incubated with secondary antibodies for 1 h at room temperature, washed again four times then imaged. Secondary antibodies used were Donkey anti-Goat IgG H&L (IRDye® 800CW) preadsorbed (ab216775) and Donkey anti-Rabbit IgG H&L (IRDye® 680RD) preadsorbed (ab216779) at 1/20000 dilution.

**Blocking buffer:** 3% milk in TBS-0.1% Tween® 20 (TBS-T)

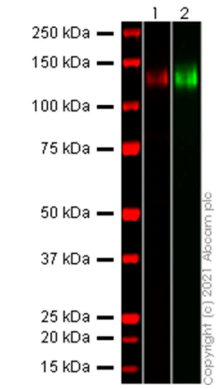
All lanes:
Western blot - Anti-SARS-CoV-2 Spike Glycoprotein S1 antibody [EPR24852-116] - BSA and Azide free (ab283943) at 1/1000 dilution

Lanes 1 and 3:
Expi293 cells transfected with SARS-CoV2 3xFlag Spike Protein at 20 µg

Lanes 2 and 4:
Expi293 cells transfected with SARS-CoV1 3xFlag Spike Protein at 20 µg

Secondary

All lanes:
Donkey anti-Goat IgG H&L (IRDye® 800CW) preadsorbed (ab216775) and Donkey anti-Rabbit IgG H&L (IRDye® 680RD) preadsorbed (ab216779) at 1/20000 dilution. at 1/20000 dilution




## Western blot - Anti-SARS-CoV-2 Spike Glycoprotein S1 antibody [EPR24852-116] - BSA and Azide free (ab283943)

This data was developed using ab283942, the same antibody clone in a different buffer formulation.
**Secondaries**

**Lane 1:** Red – loading control Mouse anti-6x His tag antibody (ab18184) observed at 135 kDa

**Lanes 2:** Green – ab283942 observed at 135 kDa

ab283942 was shown to bind specifically to SARS-CoV-2 spike glycoprotein S1 in Western blot. Samples were run on an SDS-PAGE gel then transferred onto a nitrocellulose membrane. Membranes were blocked in 3 % milk in TBS-0.1 % Tween® 20 (TBS-T) before incubation with primary antibodies overnight at 4 °C. Blots were washed four times in TBS-T, incubated with secondary antibodies for 1 h at room temperature, washed again four times then imaged.

Secondary antibodies used were Goat anti-Rabbit IgG H&L (IRDye® 800CW) preadsorbed (ab216773) and Goat anti-Mouse IgG H&L (IRDye® 680RD) preadsorbed (ab216776) at 1/20000 dilution.

**Blocking buffer:** 3% milk in TBS-0.1% Tween® 20 (TBS-T)
All lanes:
Western blot - Anti-SARS-CoV-2 Spike Glycoprotein S1 antibody [EPR24852-116] - BSA and Azide free (ab283943) at 1/1000 dilution

All lanes:
Western blot - Recombinant human coronavirus SARS-CoV-2 Spike Glycoprotein S1 (Active) (ab273068) at 0.2 µg

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