Spike-S1-Fc

Soluble SARS-CoV-2 Spike S1 protein fused to a human IgG1 Fc tag

Catalog code: fc-sars2-s1

https://www.invivogen.com/sars2-spike-s1-proteins

For research use only, not for diagnostic or therapeutic use

Version 20I23-NJ

PRODUCT INFORMATION

Contents:
- 50 µg of lyophilized Spike-S1-Fc protein
- 1.5 ml endotoxin-free water

Protein construction:
Codon-optimized spike glycoprotein S1 domain [V16-R685] with a C-terminal human IgG1 Fc tag

Accession sequence: YP_009724390 (native sequence)

Species: SARS-CoV-2 (2019-nCoV); Wuhan-Hu-1 (D614) isolate

Tag: C-terminal human IgG1 Fc

Total protein size: 920 a.a. (secreted form)

Molecular weight: ~124 kDa

Purification: Protein G affinity chromatography

Purity: >95% (SDS-PAGE)

Formulation:
0.2 µm filtered solution in a sodium phosphate buffer with glycine, saccharose, and stabilizing agents

Storage:
- Product is shipped at room temperature. Store lyophilized product at -20 °C. Lyophilized product is stable for at least 1 year.
- Reconstituted protein is stable for 1 month when stored at 4°C and for 1 year when aliquoted and stored at -20 °C. Avoid repeated freeze-thaw cycles.

Quality control:
- The size and purity of the protein has been confirmed by SDS-PAGE.
- Spike-S1-Fc has been functionally validated by ELISA using the Anti-SARS-CoV-Spike human IgM (clone CR3022).
- Absence of bacterial contamination (e.g. lipoproteins and endotoxins) has been confirmed using HEK-Blue™ TLR2 and TLR4 cellular assays.

BACKGROUND

The SARS-CoV-2 Spike S1 subunit plays a crucial role in the viral entry into the target cell. The S1 subunit features an N-term S1-NTD region and a C-term S1-CTD region. While S1-NTD is thought to mediate sugar-binding, the S1-CTD allows the virus binding to ACE2 through the receptor-binding domain (RBD)[1-3]. In its resting conformation, S1 exerts a physical constraint on the Spike fusion subunit[3]. Research is ongoing to understand the exact mechanisms that drive conformation changes in S1 allowing subsequent membrane fusion events. S1 is a candidate for subunit vaccines against SARS-CoVs[4,5].

PRODUCT DESCRIPTION

Spike-S1-Fc is a soluble SARS-CoV-2 protein generated by fusing the Spike S1 domain [V16-R685] to a C-terminal human IgG1 Fc tag with a TEV (Tobacco Etch Virus) sequence linker. This fusion protein has a molecular weight of ~124 kDa on an SDS-PAGE gel. Spike-S1-Fc has been generated by recombinant DNA technology, produced in CHO cells, and purified by protein G affinity chromatography.

APPLICATIONS

- **Vaccination studies:** using combinations of Spike protein antigens and adjuvants.
- **Antibody screening:** finding anti-Spike antibodies that can neutralize the SARS-CoV-2 infection.
- **Inhibitor screening:** finding small molecules, or antibodies able to block the SARS-CoV-2 RBD interaction with the ACE2 receptor.
- **ACE2 cellular expression screening:** in primary isolated cells or transfected cells.

METHODS

Spike-S1-Fc resuspension (100 µg/ml)

Note: Ensure you see the lyophilized pellet before resuspension.
- Add 500 µl of endotoxin-free water to the vial and gently pipette until completely resuspended.
- Prepare aliquots and store at -20 °C or 4°C.

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PROTEIN SEQUENCE

M E I K V L F A L I C I A V A E A K P T E L E V N L T T R T Q L P P A Y
T N S F T R G V Y Y P D K V F R S S V L H S T Q D L F L P F F S N V T
W F H A I H V S G T N G T K R F D N P V L P F N D G V Y F A S T E K
S N I I R G W I F G T T L D S K T Q S L L I V N N A T N V V I K V C E F
Q F C N D P F L G V Y Y H K N N K S W M E S E F R V Y S S A N N C T
F E Y V S Q P F L M D L E G K Q G N F K N L R E F V F K N I D G Y F
K I Y S K H T P I N L V R D L P Q G F S A L E P L V D L P I G I N I T R
F Q T L L A L H R S Y L T P G D S S S G W T A G A A A Y Y V G Y L Q P
R T F L L K Y N E N G T I T D A V D C A L D P L S E T K C T L K S F T
V E K G I Y Q T S N F R V Q P T E S I V R F P N I T N L C P F G E V F
N A T R F A S V Y A W N R K R I S N C V A D Y S V L Y N S A S F S T F
K C Y G V S P T K L N D L C F T N V Y A D S F V I R G D E V R Q I A P
G Q T G K I A D Y N Y K L P D D F T G C V I A W N S N N L D S K V G
G N Y N Y L Y R L F R K S N L K P F E R D I S T E I Y Q A G S T P C N
G V E G F N C Y F P L Q S Y G F Q P T N G V G Y Q P Y R V V V L S F
E L L H A P A T V C G P K K S T N L V K N K C V N F N F N G L T G T
G V L T E S N K K F L P F Q Q F G R D I A D T T D A V R D P Q T L E I
L D I T P C S F G G V S V I T P G T N T S N Q V A V L Y Q D V N C T E
V P V A I H A D Q L T P T W R V Y S T G S N V F Q T R A G C L I G A E
H V N N S Y E C D I P I G A G I C A S Y Q T Q T N S P R R A R R T E N
L Y F Q G S G S E P K S S D K T H T C P P C P A P E A E G G P S V F L
F P P K P K D Q L M I S R T P E V T C V V V D V S H E D P E V K F N
W Y V D G V E V H N A K T K P R E E Q Y N S T Y R V V S V L T V L H
Q D W L N G K E Y K C K V S N K A L P A S I E K T I S K A K G Q P R
E P Q V Y T L P P S R E E M T K N Q V S L T C L V K G F Y P S D I A V
E W E S N G Q P E N N Y K T T P P V L D S D G S F F L Y S K L T V D
K S R W Q Q G N V F S C S V L H E A L H N H Y T Q K S L S L S P G K

Green: signal sequence
Purple: stabilizing amino acid sequence
Blue: Spike S1 sequence
Black: TEV cleavage sequence
Red: Human IgG1 Fc sequence

REFERENCES

1. Li F., 2016. Structure, function, and evolution of coronavirus spike proteins. Annu. Rev. Virol. 3:237-261. **2. Li F. *et al.*, 2005.** Structure of SARS coronavirus spike receptor-binding domain complexed with receptor. Science. 309:1864-1868. **3. Walls A.C. *et al.*, 2020.** Structure, function, and antigenicity of the SARS-CoV-2 spike glycoprotein. Cell. 181(2):281-292.e6. **4. Wang N. *et al.*, 2020.** Subunit vaccines against emerging pathogenic human coronaviruses. Front. Microbiol. 11:298. DOI: 10.3389/fmicb.2020.00298. **5. Padron-Regalado E., 2020**. Vaccines for SARS-CoV-2: Lessons from other coronavirus strains. Infect. Dis. Ther. DOI: 10.1007/s40121-020-00300-x.

RELATED PRODUCTS

Product	Catalog Code
Anti-Spike-RBD-hIgG1	srbd-mab1
Anti-Spike-RBD-hIgM	srbd-mab5
Anti-Spike-RBD-hIgA2	srbd-mab6
hACE2-Fc	fc-hace2
Spike-S1-His	his-sars2-s1
Spike-RBD-His	his-sars2-srbd
Spike-RBD-Fc	fc-sars2-srbd
Nucleocapsid-His	his-sars2-n
Nucleocapsid-Fc	fc-sars2-n
pDUO2-hACE2-TMPRSS2a	pduo2-hace2tpsa

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