

## PRODUCT DATASHEET

### SARS-CoV-2 Spike S1 protein (expressed in HEK293 cells)

**Cat. No.:** RI975603100

**Type:** Recombinant protein

**Size:** 0.1 mg

**Source:** HEK293

**Species:** SARS-CoV-2

#### Description

The recombinant SARS-CoV-2 Spike S1 Protein (YP\_009724390.1) (Val16-Arg685) with C-terminal His-tag consists of 681 amino acids. Its predicted molecular mass of 77 kDa. The apparent molecular mass of S1 in SDS-PAGE is around 120 kDa, probably due to glycosylation. The concentration of protein was determined by BCA.

#### Other names

Severe acute respiratory syndrome coronavirus 2 spike glycoprotein S1, 2019 novel coronavirus S1 protein, SARS-CoV-2 S1 subunit, COVID-19

#### Introduction to the molecule

Coronaviruses (CoVs), within the order Nidovirales, are enveloped, single-strand, positive-sense RNA viruses with a large genome of approximately 30 kbp in length. A human infecting coronavirus (viral pneumonia) initially known as 2019 novel coronavirus (2019-nCoV) was found in the fish market at the city of Wuhan, Hubei province of China in December 2019. The virus is now named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

SARS-CoV-2 shares an 87% identity to the 2 bat-derived severe acute respiratory syndrome 2018 SARS-CoV-2 located in Zhoushan of eastern China. SARS-CoV-2 has an analogous receptor-BD-structure to that of 2018 SARS-CoV, even though there is a.a. diversity so thus the SARS-CoV-2 might bind to ACE2 receptor protein (angiotensin-converting enzyme 2) in humans.

While bats are possibly the host of SARS-CoV-2, researchers suspect that animal from the ocean sold at the seafood market was an intermediate host. RSCU analysis proposes that the SARS-CoV-2 is a recombinant within the viral spike glycoprotein between the bat coronavirus and an unknown coronavirus.

Coronaviruses contain at least four structural proteins: Spike (S) protein, envelope (E) protein, membrane (M) protein, and nucleocapsid (N) protein.

The spike (S) glycoprotein is a type I transmembrane glycoprotein that plays an important role in mediating viral infection and is common to all HCoVs. The S proteins consist of two subunits, S1 and S2. The S1 subunit binds the cellular receptor through its receptor-binding domain (RBD), followed by conformational changes in the S2 subunit, which allows the fusion peptide to insert into the host target cell membrane. The heptad repeat 1 (HR1) region in the S2 subunit forms a homotrimeric assembly, which exposes three highly conserved hydrophobic grooves on the surface that bind heptad repeat 2 (HR2). This six-helix bundle (6-HB) core structure is formed during the fusion process and helps bring the viral and cellular membranes into close proximity for viral fusion and entry. Thus, the S protein is an important target protein for the development of specific drugs.

#### Research topic

COVID-19, Immune Response, Infection and Inflammation

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**Purity**

> 95% (SDS-PAGE)

**Biological activity**

Strong binding ability with human ACE2 protein and binding capacity to a human anti-S1 monoclonal antibody (determined by ELISA).

**Endotoxin**

<5 EU/mg, determined by the LAL method

**Formulation:**

Lyophilized from PBS buffer pH 7.4

**Reconstitution:**

For reconstitution add 100 mL of deionized water, mix gently and incubate the reconstituted product for 10 minutes at room temperature prior to use.

**Shipping**

At ambient temperature. Upon receipt, store the product at the temperature recommended below.

**Storage, Stability/Shelf Life**

Lyophilized protein can be stored at -20°C to -80°C. Reconstituted protein should be stored at 4°C while using and for long term storage at -20°C to -80°C. Avoid repeated freeze - thaw cycles.

**Quality control**

BCA to determine quantity of the protein.

SDS PAGE to determine purity of the protein.

LAL to determine quantity of endotoxin.

**Applications**

COVID-19, ELISA, Western blotting

**Note**

This product is intended for research use only.

