

SARS-CoV-2 (C.1.2) Spike S1+S2 trimer Protein (His)

General Information

Protein Construction:	A DNA sequence encoding the SARS-CoV-2 Spike S1+S2 (YP_009724390.1, with mutations P9L, C136F, 144-145 del, R190S, D215G, Y449H, E484K, N501Y, D614G, H655Y, N679K, T716I, F817P, T859N, A892P, A899P, A942P, K986P, V987P and furin cleavage site mutants) expressed with the bacteriophage T4 fibritin and a polyhistidine tag at the C-terminus. The mutations were identified in the SARS-CoV-2 variant (known as variant C.1.2) which emerged in the South Africa.
Species:	SARS-CoV-2
Expression Host:	HEK293
Accession:	YP_009724390.1
Molecular Weight:	136.14 kDa (predicted)

QC Testing

Biological Activity:	Immobilized human ACE2 protein (mFc tag) at 2 µg/mL (100 µL/well) can bind SARS-CoV-2 (C.1.2) Spike S1+S2 trimer Protein (ECD, His tag), the EC50 is 2-16 ng/mL.
Purity:	> 95 % as determined by SDS-PAGE. > 95 % as determined by SEC-HPLC.
Endotoxin:	< 1.0 EU per µg protein as determined by the LAL method.
Formulation:	Lyophilized from a sodium citrate buffer system at pH 6.0. Please contact us for any concerns or special requirements. Normally 5 % - 8 % trehalose, mannitol and 0.01% Tween 80 are added as protectants before lyophilization. Please refer to the specific buffer information in the hard copy of CoA.

Preparation and Storage

Reconstitution:	A hardcopy of datasheet with reconstitution instructions is sent along with the products. Please refer to it for detailed information.
Stability & Storage:	Samples are stable for up to twelve months from date of receipt at -20°C to -80°C. Store it under sterile conditions at -20°C to -80°C. It is recommended that the protein be aliquoted for optimal storage. Avoid repeated freeze-thaw cycles.
Shipping:	In general, recombinant proteins are provided as lyophilized powder which are shipped at ambient temperature. Bulk packages of recombinant proteins are provided as frozen liquid. They are shipped out with blue ice unless customers require otherwise.

Protein Background

The spike (S) glycoprotein of coronaviruses contains protrusions that will only bind to certain receptors on the host cell. Known receptors bind S1 are ACE2, angiotensin-converting enzyme 2; DPP4, dipeptidyl peptidase-4; APN,

aminopeptidase N; CEACAM, carcinoembryonic antigen-related cell adhesion molecule 1; Sia, sialic acid; O-ac Sia, O-acetylated sialic acid. The spike is essential for both host specificity and viral infectivity. The term 'peplomer' is typically used to refer to a grouping of heterologous proteins on the virus surface that function together. The spike (S) glycoprotein of coronaviruses is known to be essential in the binding of the virus to the host cell at the advent of the infection process. It's been reported that SARS-CoV-2 (COVID-19 coronavirus, 2019-nCoV) can infect the human respiratory epithelial cells through interaction with the human ACE2 receptor. The spike protein is a large type I transmembrane protein containing two subunits, S1 and S2. S1 mainly contains a receptor binding domain (RBD), which is responsible for recognizing the cell surface receptor. S2 contains basic elements needed for the membrane fusion. The S protein plays key parts in the induction of neutralizing-antibody and T-cell responses, as well as protective immunity. The main functions for the Spike protein are summarized as: Mediate receptor binding and membrane fusion; Defines the range of the hosts and specificity of the virus; Main component to bind with the neutralizing antibody; Key target for vaccine design; Can be transmitted between different hosts through gene recombination or mutation of the receptor binding domain (RBD), leading to a higher mortality rate.

Reference

Shen S, et al. (2007) Expression, glycosylation, and modification of the spike (S) glycoprotein of SARS CoV. *Methods Mol Biol.* 379: 127-35.

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