

SARS-CoV-2 Spike S1+S2 Protein (G142D & E154K & L452R & E484Q & D614G & P681R & Q1071H & H1101D)

General Information

Protein Construction:	A DNA sequence encoding the SARS-CoV-2 Spike S1+S2 (YP_009724390.1, with mutations G142D, E154K, L452R, E484Q, D614G, P681R, Q1071H, H1101D) (Met1-Pro1213) was expressed with a C-terminal polyhistidine tag followed by an AVI tag. The expressed protein was biotinylated in vivo by the Biotin-Protein ligase (BirA enzyme) which is co-expressed. The mutations were identified in the SARS-CoV-2 variant (known as B.1.617) which emerged in the India.
Species:	SARS-CoV-2
Expression Host:	Baculovirus-Insect Cells
Accession:	A0A6G7K2L4
Molecular Weight:	136.29 kDa (predicted)

QC Testing

Biological Activity:	Testing in progress
Purity:	> 85 % as determined by SDS-PAGE.
Endotoxin:	< 1.0 EU per µg protein as determined by the LAL method.
Formulation:	Lyophilized from sterile 20mM Tris, 300mM NaCl, 10% glycerol, pH 8.0. 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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Tel: 781-999-4286 E_mail: info@targetmol.com Address: 36 Washington Street, Wellesley Hills, MA 02481