Recombinant SARS-CoV-2 Spike Glycoprotein (S1), His-tagged

Cat. No. HUM-372 **Lot. No.** (See product label)

SPECIFICATION

Product Overview	SARS-CoV-2 Spike S1, His-tag is a recombinant antigen which contains the Spike protein amino acids 1-674 of subunit 1. Spike S1 protein is manufactured to high yield and purity using the Native Antigens baculovirus-insect cell platform. SARS-CoV-2, previously known as the 2019 Novel Coronavirus (2019-nCoV), causes the pandemic COVID-19 disease.
Tag	His
Background	In late December, 2019, a number of patients with viral pneumonia (now called 2019-nCoV acute respiratory disease) were found to be epidemiologically associated with the Huanan seafood market in Wuhan, in the Hubei province of China. A novel, human-infecting coronavirus, provisionally named 2019 Novel Coronavirus (2019-nCoV) and since named SARS-CoV-2, was identified by genomic sequencing (Lu et al., 2020). SARS-CoV-2 is closely related (88% identity) to two bat-derived severe acute respiratory syndrome (SARS)-like coronaviruses, collected in 2018 in Zhoushan, eastern China, but were more distant from SARS-CoV (~79% identity) and MERS-CoV (~50% identity). However, although bats might be the original host of this virus, an animal sold at the seafood market in Wuhan may have acted as an intermediate host (Lu et al., 2020). Relative synonymous codon usage (RSCU) analysis suggests that SARS-CoV-2 is a recombinant between the bat coronavirus and an origin-unknown coronavirus, and it has been proposed that a snake could have acted as the reservoir. The recombination event occurred within the viral spike glycoprotein (Ji et al., 2020). Homology modelling shows that SARS-CoV-2 has a similar receptor-binding domain structure to that of SARS-CoV, despite amino acid

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variation at some key residues. Therefore, SARS-CoV-2 may be able to bind to the angiotensin-converting enzyme 2 (ACE2) receptor in humans (Lu et al., 2020). SARS-CoV-2 is a respiratory virus which causes coronavirus disease 2019 (COVID-19); it spreads primarily through contact with an infected person through respiratory droplets generated when a person coughs or sneezes, or through droplets of saliva or discharge from the nose. The incubation period is believed to range from 2-11 days. Infection with SARS-CoV-2 can cause mild symptoms including a runny nose, sore throat, cough, and fever. However, it can be more severe for some people and can lead to pneumonia or breathing difficulties. The elderly, and people with pre-existing medical conditions (such as, diabetes and heart disease) appear to be more vulnerable to becoming severely ill with the virus (WHO, 2020).

The coronavirus spike (S) glycoprotein is a class I viral fusion protein on the outer envelope of the virion that plays a critical role in viral infection by recognizing host cell receptors and mediating fusion of the viral and cellular membranes (Li, 2016). The S glycoprotein is synthesized as a precursor protein consisting of ~1,300 amino acids that is then cleaved into an amino (N)-terminal S1 subunit (~700 amino acids) and a carboxyl (C)-terminal S2 subunit (~600 amino acids). Three S1/S2 heterodimers assemble to form a trimer spike protruding from the viral envelope. The S1 subunit contains a receptor-binding domain (RBD), while the S2 subunit contains a hydrophobic fusion peptide and two heptad repeat regions. Triggered by receptor binding, proteolytic processing and/or acidic pH in the cellular compartments, the class I viral fusion protein undergoes a transition from a metastable prefusion state to a stable postfusion state during infection, in which the receptor-binding subunit is cleaved, and the fusion subunit undergoes large-scale conformational rearrangements to expose the hydrophobic fusion peptide, induce the formation of a six-helix bundle, and bring the viral and cellular membranes close for fusion (Belouzard et al., 2012). The trimeric SARS coronavirus (SARS-CoV) S glycoprotein consisting of three S1-S2 heterodimers binds the cellular receptor angiotensin-converting enzyme 2 (ACE2) and mediates fusion of the viral and cellular membranes through a pre- to postfusion conformation transition (Song et al., 2018).

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Formulation	Dulbecco's phosphate buffered saline (DPBS) pH 7.4.
Notes	This product is intended for research and manufacturing uses only. It is not a diagnostic device. The user assumes all responsibility for care, custody and control of the material, including its disposal, in accordance with all regulations.
Type	Recombinant
ClassID 1	Infectious Disease

GENE INFORMATION

Synonyms	SARS-CoV-2 Spike Glycoprotein (S1)

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