Daresbury Proteins

Product description

Name: Recombinant SARS-CoV-2 Spike protein, P.1. variant of concern (Brazilian variant, L18F, T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, D614G, H655Y, T1027I and V1176F). Full-length soluble with foldon trimerization motif, mutated Furin recognition site and 6 stabilising mutations (F817P, A892P, A899P, A942P, K986P and V987P), based on/modified from Amanat *et al*, 2020 and Hsieh *et al*, 2020.

Synonyms: Gamma Spike glycoprotein, Gamma variant of concern, Gamma mutant S protein.

Species: Severe Acute Respiratory Syndrome Coronavirus 2

Source: HEK293

Amino Acids: 16-1211

Tag: 8xHis at the C terminus.

Predicted Molecular Weight: 137 kDa

Protein ID: P0DTC2

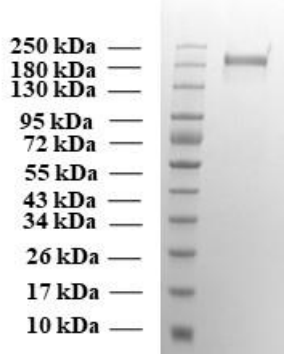
Sequence:

VNFTNRTQLPSAYTNSFTRGVYYPDKVFRSSVLHSTQDLFLPFFSNVTWFHAIHVSGTNGTKRFDNPVLPFNDGVYFASTEKSNIIRGWIFGT
TLDSKTQSLLIVNNATNVVIKVCEFQFCNYPFLGVYYHKNNKSWMESEFRVYSSANNCTFEYVSQPFLMDLEGKQGNFKNLSEFVFKNIDGYF
KIYSKHTPINLVRDLPQGFSALEPLVDLPIGINITRFQTLLALHRSYLTPGDSSSGWTAGAAAYYVGYLQPRTFLLKYNENGTITDAVDCALD
PLSETKCTLKSFTVEKGIYQTSNFRVQPTESIVRFPNITNLCPFGEVFNATRFASVYAWNRKRISNCVADYSVLYNSASFSTFKCYGVSPTKL
NDLCFTNVYADSFVIRGDEVRQIAPGQTGTIADYNYKLPDDFTGCVIAWNSNNLDSKVGGNYNYLYRLFRKSNLKPFERDISTEIYQAGSTPC
NGVKGFNCYFPLQSYGFQPTYGVGYQPYRVVVLSFELLHAPATVCGPKKSTNLVKNKCVNFNFNGLTGTGVLTESNKKFLPFQQFGRDIADTT
DAVRDPQTLEILDITPCSFGGVSVITPGTNTSNQVAVLYQGVNCTEVPVAIHADQLTPTWRVYSTGSNVFQTRAGCLIGAEYVNNSYECDIPI
GAGICASYQTQTNSPRGAGSVASQSIIAYTMSLGAENSVAYSNNSIAIPTNFTISVTTEILPVSMTKTSVDCTMYICGDSTECSNLLLQYGSF
CTQLNRALTGIAVEQDKNTQEVFAQVKQIYKTPPIKDFGGFNFSQILPDPSKPSKRSPIEDLLFNKVTLADAGFIKQYGDCLGDIAARDLICA
QKFNGLTVLPPLLTDEMIAQYTSALLAGTITSGWTFGAGPALQIPFPMQMAYRFNGIGVTQNVLYENQKLIANQFNSAIGKIQDSLSSTPSAL
GKLQDVVNQNAQALNTLVKQLSSNFGAISSVLNDILSRLDPPEAEVQIDRLITGRLQSLQTYVTQQLIRAAEIRASANLAAIKMSECVLGQSK
RVDFCGKGYHLMSFPQSAPHGVVFLHVTYVPAQEKNFTTAPAICHDGKAHFPREGVFVSNGTHWFVTQRNFYEPQIITTDNTFVSGNCDVVIG
IVNNTVYDPLQPELDSFKEELDKYFKNHTSPDVDLGDISGINASFVNIQKEIDRLNEVAKNLNESLIDLQELGKYEQYIKGSGSGYIPEAPRD
GQAYVRKDGEWVLLSTFLGSGHHHHHHHH

Product specifications

Estimated Molecular Weight, SDS-PAGE: ≈190 kDa

Grade & Purity: >90% as estimated by SDS-PAGE stained with Instant Blue Stain (Expedeon).



Endotoxins: Less than 0.1 ng/µg (1 IEU/µg), as measured by LAL method.

Formulation: PBS 20% Glycerol

Shipping

Product is shipped either on dry or wet ice or frozen gel packs. Upon receipt, store at -20°C to -70°C.

Product application and Storage

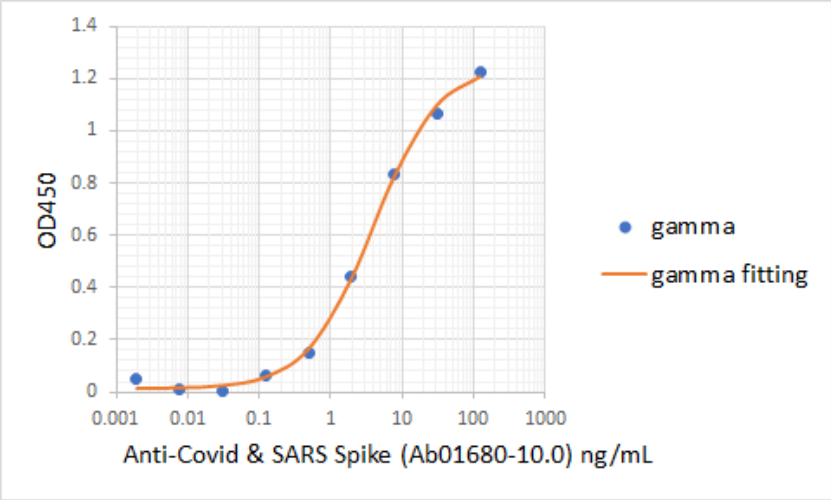
Storage: The protein should be stored at -20°C to -70°C preferably in small aliquots to avoid repeated freeze-thaw cycles.

Stability: At least 12 months at -20°C to -70°C and at least 1 month at 2°C to 8°C.

Application Note: For research purposes only. Not for use in humans.

Functional data

Binding curve of anti-Cov-19&SARS S glycoprotein antibody IgG CR3022 (Absolute Antibody, Ab01680-10.0) to the trimeric Spike P.1, Gamma variant:



Background Information

The first reports of atypical pneumonia in China were announced at the very end of 2019, in the city of Wuhan, Hubei province. Its cause was identified in January 2020 as a novel β-CoV (1), named SARS-CoV-2, which started spreading very quickly causing a global pandemic COVID-19.

Spike protein attaches the virion to the cell membrane by interacting with host receptor, initiating the infection. Binding to human ACE2 receptor and internalization of the virus into the endosomes of the host cell induces conformational changes in the Spike glycoprotein (2, 3). The protein forms a trimer *in vivo* mediating receptor binding and membrane fusion (4). It has been demonstrated by Florian Krammer's group that certain mutations and the inclusion of trimerization motif can stabilize recombinant Spike protein (5, 6).

The original Wuhan strain of the virus has become quickly replaced by its more transmissible variant, mainly determined by a single amino acid point mutation D614G (7). A novel SARS-CoV-2 variant, P.1, known as Brazilian variant, originated in the Amazonas state of Brazil and started spreading quickly in adjacent countries as well as the USA (8,9).

References:

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3. Wrapp D., Wang N., Corbett KS., *et al*. Cryo-EM structure of the 2019-nCoV spike in the prefusion conformation. *Science,* 2020;367(6483):1260-1263.
4. Yin HS., Wen X., Paterson RG., Lamb RA., Jardetzky TS. Structure of the parainfluenza virus 5 F protein in its metastable, prefusion conformation. *Nature*, 2006;439(7072):38-44.
5. Amanat, F., Stadlbauer, D., Strohmeier, S., *et al.* A serological assay to detect SARS-CoV-2 seroconversion in humans. *Nat Med.,* 2020;26:1033–1036.
6. Stadlbauer, D., Amanat, F., Chromikova, V., *et al*. SARS-CoV-2 seroconversion in humans: A detailed protocol for a serological assay, antigen production, and test setup. *Current Protocols in Microbiology*, 2020;57, e100.
7. Korber, B., W. Fischer, Gnanakaran, S., *et al*. Tracking Changes in SARS-CoV-2 Spike: Evidence that D614G Increases Infectivity of the COVID-19 Virus. *Cell*, 2020;182:1-16.
8. Nascimento, VA., AL. Guerra Corado, Nascimento FO., *et al*. Genomic and phylogenetic characterisation of an imported case of SARS-CoV-2 case in Amazonas State, Brazil. *Mem. Inst. Oswaldo Cruz*, 2020;115.
9. Fujino, T., H. Nomoto, Kutsuna, S., *et al*. Novel SARS-CoV-2 variant in travellers from Brazil to Japan. *Emerg. Infect. Dis.*, 2021;27(4).