Daresbury Proteins

Product description

Name: Recombinant SARS-CoV-2 Spike protein, Omicron variant, B.1.1.529, 21K clade (A67V, del69-70, T95I, del142-144, Y145D, del211, L212I, ins214EPE, G339D, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H, T547K, D614G, H655Y, N679K, P681H, N764K, D796Y, N856K, Q954H, N969K, L981F)**.** 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: Omicron mutant, Omicron variant of concern Spike glycoprotein, 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

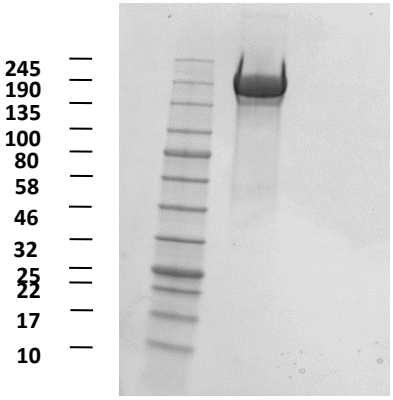
Sequence:

VNLTTRTQLP PAYTNSFTRG VYYPDKVFRS SVLHSTQDLF LPFFSNVTWF HVISGTNGTK RFDNPVLPFN DGVYFASIEK SNIIRGWIFG
TTLDSKTQSL LIVNNATNVV IKVCEFQFCN DPFLDHKNNK SWMESEFRVY SSANNCTFEY VSQPFLMDLE GKQGNFKNLR EFVFKNIDGY
FKIYSKHTPI IVREPEDLPQ GFSALEPLVD LPIGINITRF QTLLALHRSY LTPGDSSSGW TAGAAAYYVG YLQPRTFLLK YNENGTITDA
VDCALDPLSE TKCTLKSFTV EKGIYQTSNF RVQPTESIVR FPNITNLCPF DEVFNATRFA SVYAWNRKRI SNCVADYSVL YNLAPFFTFK
CYGVSPTKLN DLCFTNVYAD SFVIRGDEVR QIAPGQTGNI ADYNYKLPDD FTGCVIAWNS NKLDSKVSGN YNYLYRLFRK SNLKPFERDI
STEIYQAGNK PCNGVAGFNC YFPLRSYSFR PTYGVGHQPY RVVVLSFELL HAPATVCGPK KSTNLVKNKC VNFNFNGLKG TGVLTESNKK
FLPFQQFGRD IADTTDAVRD PQTLEILDIT PCSFGGVSVI TPGTNTSNQV AVLYQGVNCT EVPVAIHADQ LTPTWRVYST GSNVFQTRAG
CLIGAEYVNN SYECDIPIGA GICASYQTQT KSHRGAGSVA SQSIIAYTMS LGAENSVAYS NNSIAIPTNF TISVTTEILP VSMTKTSVDC
TMYICGDSTE CSNLLLQYGS FCTQLKRALT GIAVEQDKNT QEVFAQVKQI YKTPPIKYFG GFNFSQILPD PSKPSKRSPI EDLLFNKVTL
ADAGFIKQYG DCLGDIAARD LICAQKFKGL TVLPPLLTDE MIAQYTSALL AGTITSGWTF GAGPALQIPF PMQMAYRFNG IGVTQNVLYE
NQKLIANQFN SAIGKIQDSL SSTPSALGKL QDVVNHNAQA LNTLVKQLSS KFGAISSVLN DIFSRLDPPE AEVQIDRLIT GRLQSLQTYV
TQQLIRAAEI RASANLAATK MSECVLGQSK RVDFCGKGYH LMSFPQSAPH GVVFLHVTYV PAQEKNFTTA PAICHDGKAH FPREGVFVSN
GTHWFVTQRN FYEPQIITTD NTFVSGNCDV VIGIVNNTVY DPLQPELDSF KEELDKYFKN HTSPDVDLGD ISGINASVVN IQKEIDRLNE
VAKNLNESLI DLQELGKYEQ YIKGSGSGYI
PEAPRDGQAY VRKDGEWVLL STFLGSGHHH HHHH

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

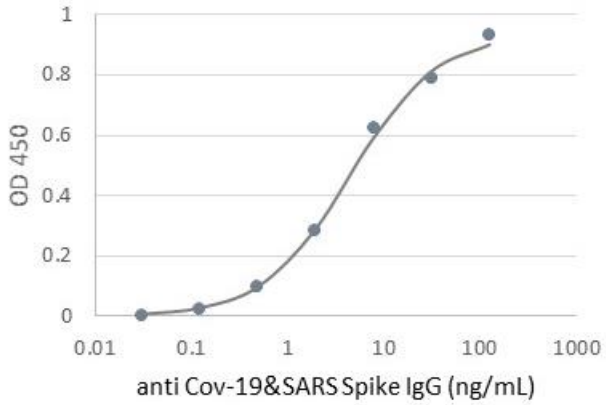
Storage: The protein should be stored at -20°C to -70°C preferably in small aliquots to avoid repeated freeze-thaw cycles.

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 Omicron variant of concern:



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).

On November 24, 2021, South Africa reported the identification of a new SARS-CoV-2 variant, B.1.1.529, to the World Health Organization (WHO). B.1.1.529 was first detected in specimens collected on November 11, 2021 in Botswana and on November 14, 2021 in South Africa.

Omicron has many concerning spike protein substitutions, some of which are known from other variants to be associated with reduced susceptibility to available monoclonal antibody therapeutics or reduced neutralization by convalescent and vaccinee sera (7).

References:

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2. Hoffmann M., Kleine-Weber H., Schroeder S., *et al*. SARS-CoV-2 Cell Entry Depends on ACE2 and TMPRSS2 and Is Blocked by a Clinically Proven Protease Inhibitor. *Cell*, 2020;181(2):271-280.
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. https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/scientific-brief-omicron-variant.html

Daresbury Proteins Ltd. A company registered in England, UK. Company number 10835544.
Address: Daresbury Labs, Keckwick Lane, Warrington WA4 4AD, United Kingdom.
Web address: www.daresburyproteins.co.uk Tel: +44 7398 623734 Email: myprotein@daresburyproteins.co.uk