



Daresbury Proteins

Product description

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Name: Recombinant SARS-CoV-2 Spike protein, Alpha Variant of Concern, B.1.1.7 variant (United Kingdom, HV69-70del, Y144del, N501Y, A570D, D614G, P681H, T716I, S982A and D1118H). Full-length soluble with foldon trimerization motif, mutated Furin recognition site and 4 stabilising mutations (A892P, A942P, K986P and V987P), based on/modified from Amanat *et al*, 2020 and Hsieh *et al*, 2020.

Synonyms: 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: PODTC2

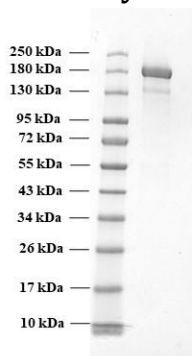
Sequence:

VNLTTRTQLPPAYTNSFTRGVYYPDKVFRSSVLHSTQDLFLPFFSNVTWFHAI SGTNGTKRFDNPVLPFNDGVYFAST EKSNI IRGW
IFGTTLD SKTQSL L I V N N A T N V V I K V C E F Q C N D P F L G V Y H K N N K S W M E S E F R V Y S S A N N C T F E Y V S Q P F L M D L E G K Q G N F K N L R E F
V F K N I D G Y F K I Y S K H T P I N L V R D L P Q G F S A L E P L V D L P I G I N I T R F Q T L L A L H R S Y L T P G D S S S G W T A G A A A Y Y V G Y L Q P R T F L L K Y
N E N G T I T D A V D C A L D P L S E T K C T L K S F T V E K G I Y Q T S N F R V Q P T E S I V R F P N I T N L C P F G E V F N A T R F A S V Y A W N R K R I S N C V A D Y S
V L Y N S A S F S T F K C Y G V S P T K L N D L C F T N V Y A D S F V I R G D E V R Q I A P G Q T G K I A D Y N Y K L P D D F T G C V I A W N S N N L D S K V G G N Y N Y L Y
R L F R K S N L K P F E R D I S T E I Y Q A G S T P C N G V E G F N C Y F P L Q S Y G F Q P T Y G V G Y Q P Y R V V V L S F E L L H A P A T V C G P K K S T N L V K N K C V N
F N F N G L T G T G V L T E S N K K F L P F Q Q F G R D I D D T T D A V R D P Q T L E I L D I T P C S F G G V S V I T P G T N T S N Q V A V L Y Q G V N C T E V P V A I H A D
Q L T P T W R V Y S T G S N V F Q T R A G C L I G A E H V N N S Y E C D I P I G A G I C A S Y Q T Q T N S H R G A G S V A S Q S I I A Y T M S L G A E N S V A Y S N N S I A I
P I N F T I S V T T E I L P V S M T K T S V D C T M Y I C G D S T E C S N L L L Q Y G S F C T Q L N R A L T G I A V E Q D K N T Q E V F A Q V K Q I Y K T P P I K D F G G F N
F S Q I L P D P S K P S K R S F I E D L L F N K V T L A D A G F I K Q Y G D C L G D I A A R D L I C A Q K F N G L T V L P P L L T D E M I A Q Y T S A L L A G T I T S G W T F
G A G P A L Q I P F A M Q M A Y R F N G I G V T Q N V L Y E N Q K L I A N Q F N S A I G K I Q D S L S S T P S A L G K L Q D V V N Q N A Q A L N T L V K Q L S S N F G A I S S
V L N D I L A R L D P P E A E V Q I D R L I T G R L Q S L Q T Y V T Q Q L I R A A E I R A S A N L A A T K M S E C V L G Q S K R V D F C G K G Y H L M S F P Q S A P H G V V F
L H V T Y V P A Q E K N F T T A P A I C H D G K A H F P R E G V F V S N G T H W F V T Q R N F Y E P Q I I T T H N T F V S G N C D V V I G I V N N T V Y D P L Q P E L D S F K
E E L D K Y F K N H T S P D V D L G D I S G I N A S V V N I Q K E I D R L N E V A K N L N E S L I D L Q E L G K Y E Q Y I K G S G S G Y I P E A P R D G Q A Y V R K D G E W V
L L S T F L G S G H H H H H H H H H H

Product specifications

Estimated Molecular Weight, SDS-PAGE: ≈190 kDa

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



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

Formulation: PBS 20% Glycerol

Shipping

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

Product application and Storage

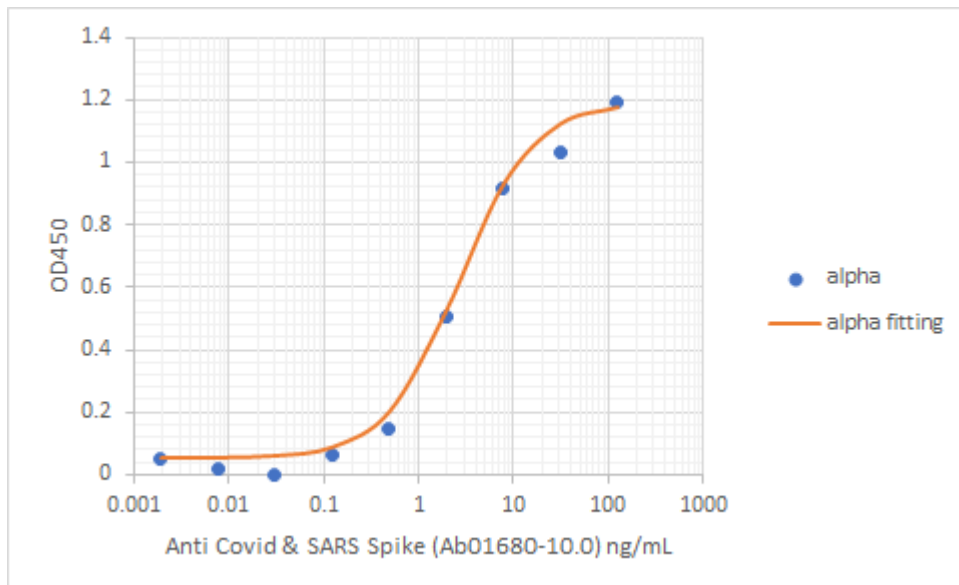
Storage: The protein should be stored at -20°C to -70°C preferably in small aliquots to avoid repeated freeze-thaw cycles.

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 B.1.1.7, Alpha 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).

The B.1.1.7 variant is a strain of the coronavirus with 8 distinctive mutations (in addition to the D614G) in the virus's spike protein and was first identified in autumn 2020 as the result of genetic sequencing of positive covid-19 samples by the Covid-19 Genomics UK Consortium (8).

References:

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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.
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7. Korber, B., Fischer, W., 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.
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