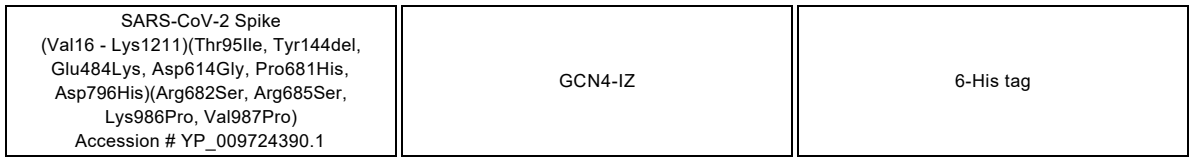
Recombinant SARS-CoV-2 B.1.1.318 Spike (GCN4-IZ) His-tag

Catalog Number: 10856-CV

DESCRIPTION

Source

Human embryonic kidney cell, HEK293-derived sars-cov-2 Spike protein



N-terminal Sequence Analysis	Val16
Predicted Molecular Mass	138 kDa

SPECIFICATIONS

SDS-PAGE	145-165 kDa, under reducing conditions.
Activity	Measured by its binding ability in a functional ELISA with Recombinant Human ACE-2 His-tag (Catalog # 933-ZN).
Endotoxin Level	<0.10 EU per 1 µg of the protein by the LAL method.
Purity	>95%, by SDS-PAGE visualized with Silver Staining and quantitative densitometry by Coomassie® Blue Staining.
Formulation	Lyophilized from a 0.2 µm filtered solution in PBS with Trehalose. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution	Reconstitute at 500 µg/mL in PBS.
Shipping	The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below.
Stability & Storage	**Use a manual defrost freezer and avoid repeated freeze-thaw cycles.** • 12 months from date of receipt, -20 to -70 °C as supplied. • 1 month, 2 to 8 °C under sterile conditions after reconstitution. • 3 months, -20 to -70 °C under sterile conditions after reconstitution.

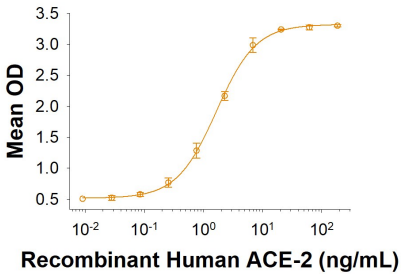
Bio-Techne®
Global | bio-techne.com info@bio-techne.com techsupport@bio-techne.com TEL: 1.612.379.2956
USA | TEL: 800.343.7475 Canada | TEL: 855.668.8722 Europe | Middle East | Africa TEL: +44.0.1235.529449
China | info.cn@bio-techne.com TEL: 400.821.3475

Recombinant SARS-CoV-2 B.1.1.318 Spike (GCN4-IZ) His-tag

Catalog Number: 10856-CV

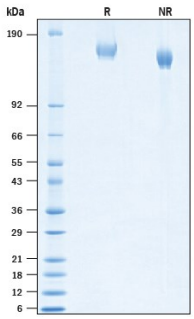
DATA

Binding Activity



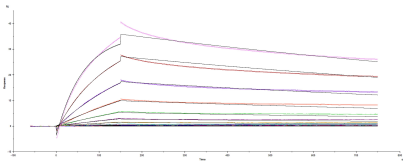
Recombinant SARS-CoV-2 B.1.1.318 Spike (GCN4-IZ) His-tag Protein Binding Activity. Recombinant SARS-CoV-2 B.1.1.318 Spike (GCN4-IZ) His-tag (Catalog # 10856-CV) binds Recombinant Human ACE-2 His-tag (Catalog # 933-ZN) in a functional ELISA.

SDS-PAGE



Recombinant SARS-CoV-2 B.1.1.318 Spike (GCN4-IZ) His-tag Protein SDS-PAGE. 2 µg/lane of Recombinant SARS-CoV-2 B.1.1.318 Spike (GCN4-IZ) His-tag Protein (Catalog # 10856-CV) was resolved with SDS-PAGE under reducing (R) and non-reducing (NR) conditions and visualized by Coomassie® Blue staining, showing bands at 145-165 kDa.

Surface Plasmon Resonance (SPR)



Binding of ACE-2 to SARS-CoV-2 Spike protein mutant B.1.1.318 variant by surface plasmon resonance (SPR). Recombinant SARS-CoV-2 B.1.1.318 variant Spike protein His-tag (Catalog #10856-CV) was immobilized on a Biacore Sensor Chip CM5, and binding to recombinant human ACE-2 (Catalog # 933-ZN) was measured at a concentration range between 0.046 nM and 94.3 nM. The double-referenced sensorgram was fit to a 1:1 binding model to determine the binding kinetics and affinity, with an affinity constant of KD=3.60 nM.

Bio-Techne®
Global | bio-techne.com info@bio-techne.com techsupport@bio-techne.com TEL: 1.612.379.2956
USA | TEL: 800.343.7475 Canada | TEL: 855.668.8722 Europe | Middle East | Africa TEL: +44.0.1235.529449
China | info.cn@bio-techne.com TEL: 400.821.3475

Recombinant SARS-CoV-2 B.1.1.318 Spike (GCN4-IZ) His-tag

Catalog Number: 10856-CV

BACKGROUND

SARS-CoV-2, which causes the global pandemic coronavirus disease 2019 (Covid-19), belongs to a family of viruses known as coronaviruses that also include MERS-CoV and SARS-CoV-1. Coronaviruses are commonly comprised of four structural proteins: Spike protein (S), Envelope protein (E), Membrane protein (M) and Nucleocapsid protein (N) (1). The SARS-CoV-2 S protein is a glycoprotein that mediates membrane fusion and viral entry. The S protein is homotrimeric, with each ~180-kDa monomer consisting of two subunits, S1 and S2 (2). In SARS-CoV-2, as with most coronaviruses, proteolytic cleavage of the S protein into S1 and S2 subunits is required for activation. The S1 subunit is focused on attachment of the protein to the host receptor while the S2 subunit is involved with cell fusion (3-5). The S protein of SARS-CoV-2 shares 75% and 29% amino acid sequence identity with S protein of SARS-CoV-1 and MERS, respectively. The S Protein of the SARS-CoV-2 virus, like the SARS-CoV-1 counterpart, binds a metallopeptidase, Angiotensin-Converting Enzyme 2 (ACE-2), but with much higher affinity and faster binding kinetics through the receptor binding domain (RBD) located in the C-terminal region of S1 subunit (6). It has been demonstrated that the S Protein can invade host cells through the CD147/EMMPRIN receptor and mediate membrane fusion (7, 8). Polyclonal antibodies to the RBD of the SARS-CoV-2 protein have been shown to inhibit interaction with the ACE-2 receptor, confirming RBD as an attractive target for vaccinations or antiviral therapy (9). There is also promising work showing that the RBD may be used to detect presence of neutralizing antibodies present in a patient's bloodstream, consistent with developed immunity after exposure to the SARS-CoV-2 (10). Several emerging SARS-CoV-2 genomes with mutations compared to the Wuhan-Hu-1 SARS-CoV-2 reference sequence have been identified, including the B.1.1.318 variant. The B.1.1.318 variant is linked to travel in West Africa and contains E484K, D614G and P681H mutations, which are commonly found in variants of concern (VOC) (11). The E484K is located in the RBD and has been identified as a potentially crucial mutation as it creates a new site for hACE-2 binding and enhances binding affinity, has been shown to confer resistance to several monoclonal antibodies and is responsible for the first confirmed SARS-CoV-2 reinfection (12, 13). The D614G mutation is located nearby to the RBD domain and has been shown to increase viral infectivity (14). The P618H mutation is found adjacent to the furin cleavage site and is proposed to enhance S protein cleavage and increase viral infectivity (15).

References:

1. Wu, F. *et al.* (2020) Nature **579**:265.
2. Tortorici, M.A. and D. Veesler (2019) Adv. Virus Res. **105**:93.
3. Bosch, B.J. *et al.* (2003). J. Virol. **77**:8801.
4. Belouzard, S. *et al.* (2009) Proc. Natl. Acad. Sci. 106:5871.
5. Millet, J.K. and G.R. Whittaker (2015) Virus Res. **202**:120.
6. Ortega, J.T. *et al.* (2020) EXCLI J. **19**:410.
7. Wang, K. *et al.* (2020) bioRxiv https://www.biorxiv.org/content/10.1101/2020.03.14.988345v1.
8. Isabel, *et al.* (2020) Sci Rep 10, 14031. https://doi.org/10.1038/s41598-020-70827-z.
9. Tai, W. *et al.* (2020) Cell. Mol. Immunol. https://doi.org/10.1016/j.it.2020.03.007.1.
10. Okba, N. M. A. et al. (2020). Emerg. Infect. Dis. https://doi.org/10.3201/eid2607.200841.
11. Peacock, T.P. *et al.* (2021) J Gen Virol. 2021 Apr:102.
12. Wang, W.B. *et al.* (2021) bioRxiv https://doi.org/10.1101/2021.02.17.431566.
13. Vasques Nonaka, C.K. *et al.* (2021) Emerg Infect Dis. https://doi.org/10.3201/eid2705.210191.
14. Zhang, L. *et al.* (2020) Nat Commun. 11:6013.
15. Lasek-Nesselquist, E. *et al.* (2021) medRxiv https://doi.org/10.1101/2021.03.10.21253285.

Bio-Techne®
Global | bio-techne.com info@bio-techne.com techsupport@bio-techne.com TEL: 1.612.379.2956
USA | TEL: 800.343.7475 Canada | TEL: 855.668.8722 Europe | Middle East | Africa TEL: +44.0.1235.529449
China | info.cn@bio-techne.com TEL: 400.821.3475