

**Synonym**

Spike,S protein,Spike glycoprotein,S glycoprotein

**Source**

Biotinylated SARS-CoV-2 Spike Trimer, His,Avitag (BA.2.12.1/Omicron) (SPN-C82Es) is expressed from human 293 cells (HEK293). It contains AA Val 16 - Pro 1213 (Accession # [QHD43416.1](#) (T19I, LPP24-26del, A27S, G142D, V213G, G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452Q, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, S704L, N764K, D796Y, Q954H, N969K, R683A, R685A, F817P, A892P, A899P, A942P, K986P, V987P)). The spike mutations are identified on the SARS-CoV-2 Omicron variant (Pango lineage: BA.2.12.1; GISAID clade: GRA). The recombinant protein is expressed from human 293 cells (HEK293) with T4 fibritin trimerization motif and a polyhistidine tag at the C-terminus. Proline substitutions (F817P, A892P, A899P, A942P, K986P, V987P) and alanine substitutions (R683A and R685A) are introduced to stabilize the trimeric prefusion state of SARS-CoV-2 S protein and abolish the furin cleavage site, respectively.

Predicted N-terminus: Val 16

**Molecular Characterization**

This protein carries a polyhistidine tag at the C-terminus, followed by an Avi tag (Avitag™)

The protein has a calculated MW of 139.8 kDa. The protein migrates as 160-190 kDa under reducing (R) condition (SDS-PAGE) due to glycosylation.

**Labeling**

*Biotinylation of this product is performed using Avitag™ technology. Briefly, the single lysine residue in the Avitag is enzymatically labeled with biotin.*

**Protein Ratio**

Passed as determined by the HABA assay / binding ELISA.

**Endotoxin**

Less than 1.0 EU per µg by the LAL method.

**Purity**

>95% as determined by SDS-PAGE.

>90% as determined by SEC-MALS.

**Formulation**

Lyophilized from 0.22 µm filtered solution in PBS with trehalose as protectant.

Contact us for customized product form or formulation.

**Reconstitution**

Please see Certificate of Analysis for specific instructions.

*For best performance, we strongly recommend you to follow the reconstitution protocol provided in the CoA.*

**Storage**

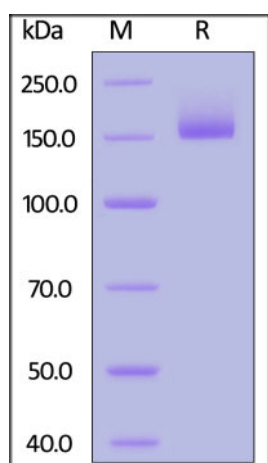
For long term storage, the product should be stored at lyophilized state at -20°C or lower.

*Please avoid repeated freeze-thaw cycles.*

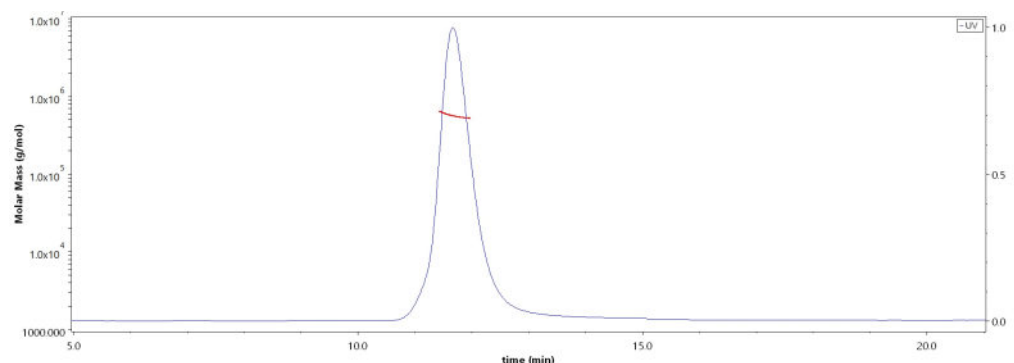
This product is stable after storage at:

- -20°C to -70°C for 12 months in lyophilized state;
- -70°C for 3 months under sterile conditions after reconstitution.

**SDS-PAGE**



**SEC-MALS**



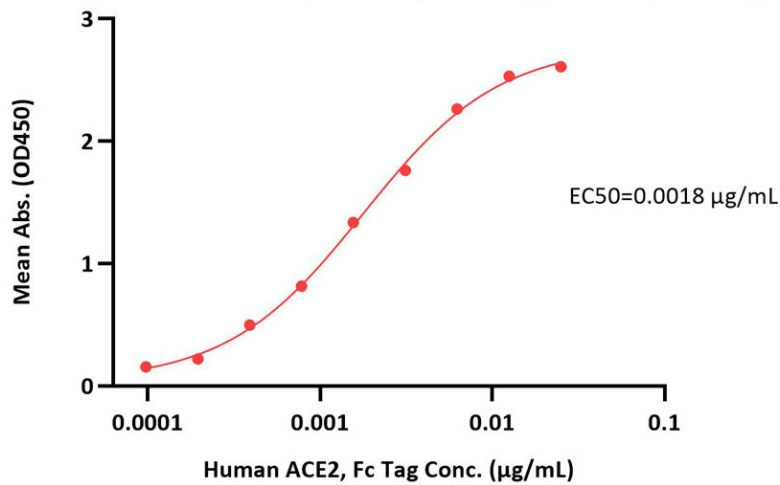
Biotinylated SARS-CoV-2 Spike Trimer, His,Avitag (BA.2.12.1/Omicron) on SDS-PAGE under reducing (R) condition. The gel was stained overnight with Coomassie Blue. The purity of the protein is greater than 95%.

The purity of Biotinylated SARS-CoV-2 Spike Trimer, His,Avitag (BA.2.12.1/Omicron) (Cat. No. SPN-C82Es) is more than 90% and the molecular weight of this protein is around 525-565 kDa verified by SEC-MALS.

[Report](#)

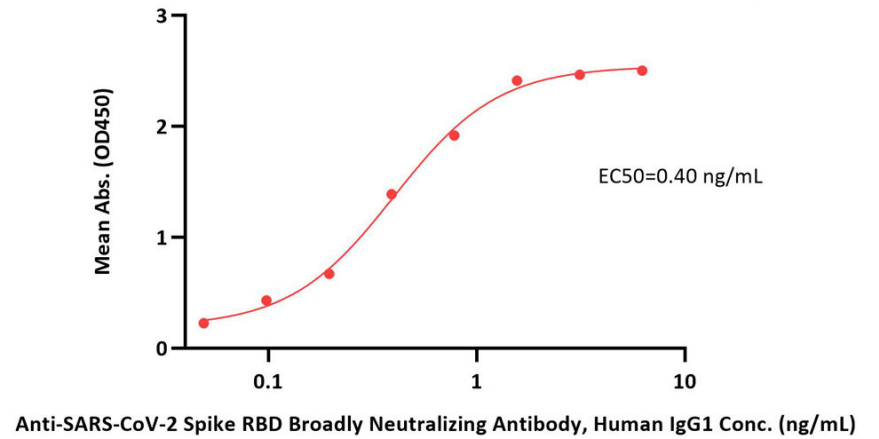
**Bioactivity-ELISA**

**Biotinylated SARS-CoV-2 Spike Trimer, His,Avitag (BA.2.12.1/Omicron) ELISA**  
0.1 µg of Biotinylated SARS-CoV-2 Spike Trimer, His,Avitag (BA.2.12.1/Omicron) per well



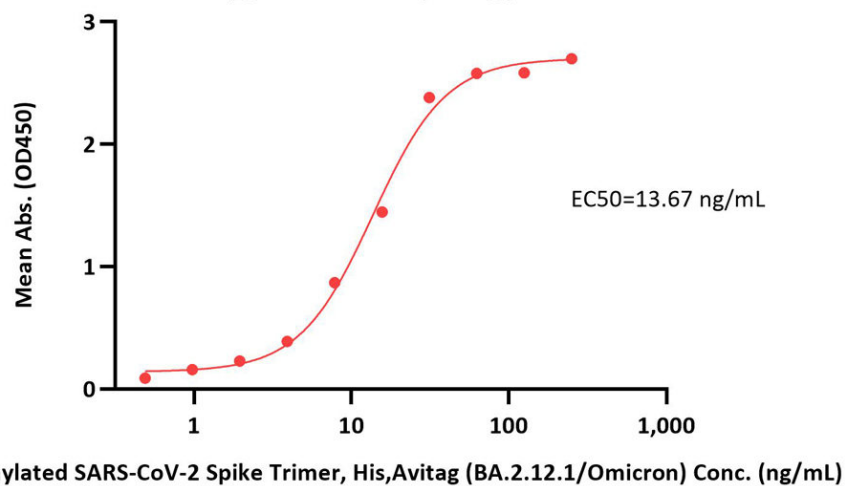
Immobilized Biotinylated SARS-CoV-2 Spike Trimer, His,Avitag (BA.2.12.1/Omicron) (Cat. No. SPN-C82Es) at 1 µg/mL (100 µL/well) on streptavidin (Cat. No. STN-N5116) precoated (0.5 µg/well) plate can bind Human ACE2, Fc Tag (Cat. No. AC2-H5257) with a linear range of 0.001-0.013 µg/mL (QC tested).

**Biotinylated SARS-CoV-2 Spike Trimer, His,Avitag (BA.2.12.1/Omicron) ELISA**  
0.1 µg of Biotinylated SARS-CoV-2 Spike Trimer, His,Avitag (BA.2.12.1/Omicron) per well



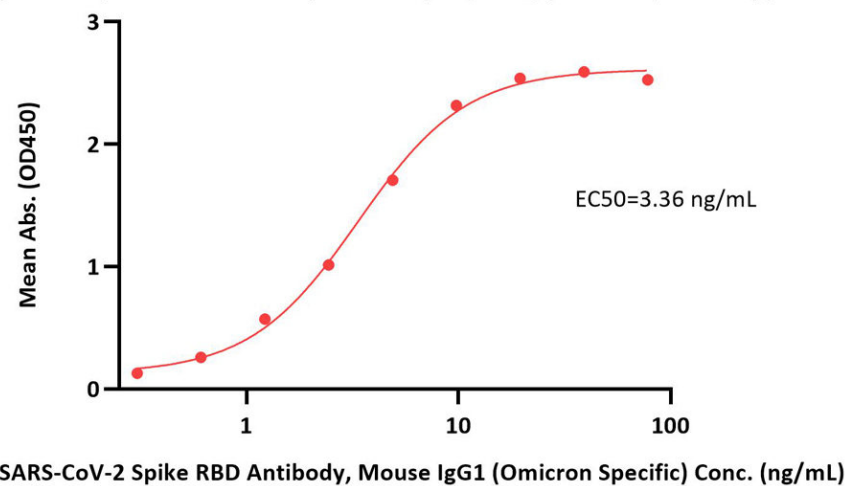
Immobilized Biotinylated SARS-CoV-2 Spike Trimer, His,Avitag (BA.2.12.1/Omicron) (Cat. No. SPN-C82Es) at 1 µg/mL (100 µL/well) on streptavidin (Cat. No. STN-N5116) precoated (0.5 µg/well) plate can bind Anti-SARS-CoV-2 Spike RBD Broadly Neutralizing Antibody, Human IgG1 (Cat. No. SPD-M265) with a linear range of 0.1-2 ng/mL (Routinely tested).

**Biotinylated SARS-CoV-2 Spike Trimer, His,Avitag (BA.2.12.1/Omicron) ELISA**  
0.5 µg of Human ACE2, Fc Tag per well



Immobilized Human ACE2, Fc Tag (Cat. No. AC2-H5257) at 5 µg/mL (100 µL/well) can bind Biotinylated SARS-CoV-2 Spike Trimer, His,Avitag (BA.2.12.1/Omicron) (Cat. No. SPN-C82Es) with a linear range of 1-63 ng/mL (Routinely tested).

**Biotinylated SARS-CoV-2 Spike Trimer, His,Avitag (BA.2.12.1/Omicron) ELISA**  
0.1 µg of Biotinylated SARS-CoV-2 Spike Trimer, His,Avitag (BA.2.12.1/Omicron) per well



Immobilized Biotinylated SARS-CoV-2 Spike Trimer, His,Avitag (BA.2.12.1/Omicron) (Cat. No. SPN-C82Es) at 1 µg/mL (100 µL/well) on streptavidin (Cat. No. STN-N5116) precoated (0.5 µg/well) plate can bind Anti-SARS-CoV-2 Spike RBD Antibody, Mouse IgG1 (Omicron Specific) (Cat. No. SPD-M305) with a linear range of 0.3-20 ng/mL (Routinely tested).

**Background**

It's been reported that SARS-CoV-2 can infect the human respiratory epithelial cells through interaction with the human ACE2 receptor. The spike protein is a large type I transmembrane protein containing two subunits, S1 and S2. S1 mainly contains a receptor binding domain (RBD), which is responsible for recognizing the cell surface receptor. S2 contains basic elements needed for the membrane fusion. The S protein plays key parts in the induction of neutralizing-antibody and T-cell responses, as well as protective immunity.

### **Clinical and Translational Updates**

Please contact us via [TechSupport@acrobiosystems.com](mailto:TechSupport@acrobiosystems.com) if you have any question on this product.