

Spike Glycoprotein Receptor Binding Domain (RBD) from SARS-Related Coronavirus 2, Beta Variant with C-Terminal Histidine Tag, Recombinant from HEK293 Cells

Catalog No. NR-55278

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Contributor:

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Manufacturer:

BEI Resources

Product Description:

A recombinant form of the spike (S) glycoprotein receptor binding domain (RBD) from severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2), Beta variant [also referred to as South Africa variant; B.1.351 lineage] was produced in human embryonic kidney HEK293 cells and purified by affinity chromatography. NR-55278 lacks the signal sequence and contains 223 residues of the SARS-CoV-2 S glycoprotein RBD and features a C-terminal hexa-histidine tag.^{1,2,3,4} NR-55278 is a Beta variant of SARS-CoV-2, which includes K417N, E484K and N501Y mutations in the S glycoprotein RBD as compared to the SARS-CoV-2 reference sequence (GenPept: [QHD43416](#)).^{1,5,6} The predicted protein sequence is shown in Figure 1. NR-55278 has a theoretical molecular weight of 25,960 daltons. The crystal structure for trimeric S glycoprotein from SARS-CoV-2, B.1.351 lineage has been solved at 3.65 Å resolution (PDB: [7LYK](#)).⁷

Note: For a detailed protocol and list of related items, see <https://labs.icaahn.mssm.edu/krammerlab/covid-19/>

The S glycoprotein mediates viral binding to the host angiotensin converting enzyme 2 (ACE2). This protein forms a trimer, and when bound to a host receptor allows fusion of the viral and cellular membranes.⁸ New SARS-CoV-2 mutations in the S glycoprotein are currently under study, and the Beta variant includes three mutations in the RBD that may have functional significance, K417N, E484K and N501Y.⁶ Structural modeling and mouse studies indicate N501Y increases S glycoprotein binding to ACE2, resulting in increased SARS-CoV-2 virulence.^{9,10} In addition, the E484K mutation has been identified in escape mutants for convalescent antisera.¹¹

Material Provided:

Each vial contains approximately 0.1 mL of NR-55278 in phosphate buffered saline (PBS). The concentration, expressed as mg per mL, is shown on the Certificate of Analysis.

Note: The long-term stability of this preparation is not known at this time. It is recommended that users confirm the activity of the product if not used within three months of receipt.

Packaging/Storage:

NR-55278 was packaged aseptically in cryovials. The product is provided on dry ice and should be stored at -60°C or colder immediately upon arrival. Freeze-thaw cycles should be avoided.

Citation:

Acknowledgment for publications should read “The following reagent was obtained through BEI Resources, NIAID, NIH: Spike Glycoprotein Receptor Binding Domain (RBD) from SARS-Related Coronavirus 2, Beta Variant with C-Terminal Histidine Tag, Recombinant from HEK293 Cells, NR-55278.”

Biosafety Level: 1

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the following publication: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health. [Biosafety in Microbiological and Biomedical Laboratories](#). 6th ed. Washington, DC: U.S. Government Printing Office, 2020; see www.cdc.gov/biosafety/publications/bmb15/index.htm.

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Figure 1 – Predicted Protein Sequence

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1  RVQPTESIVR  FPNITNLCPF  GEVFNATRFA  SVYAWNRRKRI  SNCVADYSVL
51  YNSASFSTFK  CYGVSPTKLN  DLCFTNVYAD  SFVIRGDEVK  QIAPGQTGNI
101 ADYNYKLPDD  FTGCVIAWNS  NNLDKVGGN  YNYLYRFRK  SNLKPFRDI
151 STEIYQAGST  PCNGVKGFNC  YFPLQSYGFQ  PTYGVGYQPY  RVVVLSFELL
201 HAPATVCGPK  KSTNLVKKNC  VNFHHHHHHH
    
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RBD – **Residues 1 to 223** (represents amino acid residues 319 to 541)
 K417N, E484K and N501Y Mutations – **Residues 99, 166, 183**
 Hexa-histidine tag – **Residues 224 to 229**