

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

Catalog No. NR-54004

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For research use only. Not for use in humans.

Contributor and Manufacturer:

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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), United Kingdom (UK) variant was produced in human embryonic kidney HEK293 cells and purified by affinity chromatography.¹ NR-54004 lacks the signal sequence and contains 223 residues of the SARS-CoV-2 S glycoprotein RBD and features a C-terminal hexa-histidine tag.^{2,3} NR-54004 is a UK variant of SARS-CoV-2, which includes a N501Y mutation in the S glycoprotein RBD as compared to the SARS-CoV-2 reference sequence (GenPept: [QHD43416](#)). The predicted protein sequence is shown in Figure 1. NR-54004 has a theoretical molecular weight of 25,970 daltons.

Note: For a detailed protocol and list of related items, see <https://labs.ichn.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.⁴ The UK variants of SARS-CoV-2 include multiple mutations that were first identified in the United Kingdom, and the most studied is N501Y. Structural modeling and mouse studies indicate N501Y increases S glycoprotein binding to ACE2, resulting in increased SARS-CoV-2 virulence.^{5,6}

Material Provided:

Each vial contains approximately 0.1 mL of NR-54004 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-54004 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, United Kingdom Variant with C-Terminal Histidine Tag, Recombinant from HEK293 Cells, NR-54004."

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/bmbl5/index.htm.

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References:

1. Wu, F., et al. "A New Coronavirus Associated with Human Respiratory Disease in China." *Nature* 579 (2020): 265-269. PubMed: 32015508.
2. Krammer, F., Personal Communication.
3. Amanat, F., et al. "A Serological Assay to Detect SARS-CoV-2 Seroconversion in Humans." *Nat. Med.* 26 (2020): 1033-1036. PubMed: 32398876.
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5. Gu, H., et al. "Adaptation of SARS-CoV-2 in BALB/c Mice for Testing Vaccine Efficacy." *Science* 369 (2020): 1603-1607. PubMed: 32732280.
6. Leung, K., et al. "Early Transmissibility Assessment of the N501Y Mutant Strains of SARS-CoV-2 in the United Kingdom, October to November 2020." *Euro. Surveill.* 26 (2021): pii 2002106. PubMed: 33413740.

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Figure 1 – Predicted Protein Sequence

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1  RVQPTESIVR FPNITNLCPF GEVFNATRFA SVYAWNKRKI SNCVADYSVL
51 YNSASFSTFK CYGVSP TKLN DLCFTNVYAD SFVIRGDEV R QIAPGQTGKI
101 ADYNYKLPDD FTGCVIAWNS NNLD SKVGGN YNYLYRLFRK SNLKPFERDI
151 STEIYQAGST PCNGVEGFNC YFPLQSYGFQ PTYGVGYQPY RVVVLSFELL
201 HAPATVCGPK KSTNLVKNC VNFHHHHHHH

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RBD – **Residues 1 to 223** (represents amino acid residues 319 to 541)

N501Y Mutation – **Residue 183**

Hexa-histidine tag – **Residues 224 to 229**