Vector pCMV/R Containing the SARS-Related Coronavirus 2, Spike Glycoprotein Gene, Lineage B.1.1.7, Alpha Variant

Catalog No. NR-55304
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For research use only. Not for use in humans.

Contributor:
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Manufacturer:
BEI Resources

Product Description:
NR-55304 expresses the full-length, Alpha variant spike (S) glycoprotein, and is intended for producing pseudotyped particles/pseudovirions. NR-55304 is also referred to as VRC8400. NR-55304 is not intended for recombinant protein expression.

The vector for the S glycoprotein gene from severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2), Wuhan-Hu-1 (GenBank: MN908947) was designed by codon optimizing the full-length S sequence (residues 1 to 1273) for mammalian expression and introducing point mutations found in the B.1.1.7 lineage, resulting in a spike glycoprotein gene representative of the Alpha variant. The spike gene was subcloned into the pCMV/R mammalian expression vector (also referred to as VRC8400). The protein encoded by NR-55304 contains the following point mutations: H69del, V70del, Y144del, N501Y, A570D, D614G, P681H, T716I, S982A and D1118H. The kanamycin resistance gene, aph, provides transformant selection through kanamycin resistance in Escherichia coli (E. coli). NR-55304 is also referred to as VRC7596. The resulting size of the plasmid is approximately 8240 base pairs. The complete plasmid sequence and map are provided on the BEI Resources webpage. The plasmid was produced in E. coli and extracted.

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. The S protein is a target for neutralizing antibodies. The Alpha variant of SARS-CoV-2 includes multiple S glycoprotein 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.

Material Provided:
Each vial contains plasmid DNA in TE buffer (10 mM Tris-HCl, 1 mM EDTA, pH 8.0). The DNA concentration and volume provided are shown on the Certificate of Analysis. The vial should be centrifuged prior to opening. Note: The contents of the vial should be used to replicate the plasmid in E. coli prior to mammalian expression.

Packaging/Storage:
NR-55304 was packaged aseptically in screw-capped plastic cryovials. The product is provided frozen on dry ice and should be stored at -20°C or colder immediately upon arrival. Freeze-thaw cycles should be minimized.

Citation:
Acknowledgment for publications should read “The following reagent was obtained through BEI Resources, NIAID, NIH: Vector pCMV/R Containing the SARS-Related Coronavirus 2, Spike Glycoprotein Gene, Lineage B.1.1.7, Alpha Variant, NR-55304.”

Biosafety Level: 1

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NR-55304 is claimed in U.S. Patent number 7,094,598 and the continuations, continuations-in-part, re-issues and foreign counterparts thereof.

References:
6. WHO

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