Vector pMCSG53 Containing the SARS-Related Coronavirus 2, Wuhan-Hu-1 Spike Glycoprotein Receptor Binding Domain

Catalog No. NR-52430

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For research use only. Not for use in humans.

Contributor:

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Manufacturer:

BEI Resources

Product Description:

The vector for the receptor binding domain (RBD) of the spike (S) glycoprotein gene from severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2), Wuhan-Hu-1 (GenBank: MN908947) was designed by subcloning the codon-optimized S protein RBD (amino acids 319 to 542) into the pMCSG53 *Escherichia coli (E. coli)* expression vector.[1,2] pMCSG53 is a ligation-independent cloning (LIC) vector containing an N-terminal hexa-histidine tag and tobacco etch virus (TEV) protease recognition site prior to the RBD. In addition, the vector includes tRNA genes covering rare codons for arginine (AGG/AGA) and isoleucine (AUA) to improve expression in the host, *E. coli*.[3,4] NR-52430 contains the beta-lactamase gene, *bla*, to provide transformant selection through ampicillin resistance in *E. coli*. The resulting size of the plasmid is approximately 5500 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.[5]

Material Provided:

Each vial contains 0.2 µg of plasmid DNA in 10 mM Tris-HCl, 1 mM EDTA, pH 8.0. 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 recombinant protein expression.

Packaging/Storage:

NR-52430 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 pMCSG53 Containing the SARS-Related Coronavirus 2, Wuhan-Hu-1 Spike Glycoprotein Receptor Binding Domain, NR-52430, contributed by the Center for Structural Genomics of Infectious Diseases under HHSN272201700060C."

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. Satchell, K. J., Personal Communication.
2. Wu, F., et al. "A New Coronavirus Associated with Human Respiratory Disease in China." Nature 579 (2020): 265-269. PubMed: 32015508.
3. Stols, L., et al. "A New Vector for High-Throughput, Ligation-Independent Cloning Encoding a Tobacco Etch Virus Protease Cleavage Site." Protein Expr. Purif. 25 (2002): 8-15. PubMed: 12071693.
4. Eschenfeldt, W. H., et al. "New LIC Vectors for Production of Proteins from Genes Containing Rare Codons." J. Struct. Funct. Genomics 14 (2013): 135-144. PubMed: 24057978.
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