

**Vector pMCSG53 Containing the SARS-Related Coronavirus 2, Wuhan-Hu-1 Non-Structural Protein 10 Gene**

**Catalog No. NR-52425**

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**Contributor:**

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**Manufacturer:**

BEI Resources

**Product Description:**

The non-structural protein 10 (nsp10) gene from severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2), Wuhan-Hu-1 (GenBank: [MN908947](#)) was codon optimized and cloned into the pMCSG53 plasmid.<sup>1,2</sup> pMCSG53 is an *Escherichia coli* (*E. coli*) expression vector that contains an N-terminal hexa-histidine tag, followed by a tobacco etch virus (TEV) protease recognition site prior to the insert coding sequence, resulting in the expression of a cleavable histidine-tagged protein. It also contains tRNA genes covering rare codons for Arg (AGG/AGA) and Ile (AUA) to improve expression in *E. coli*. The beta-lactamase gene, *bla*, provides transformant selection through ampicillin resistance in *E. coli*.<sup>3,4</sup> The resulting size of the plasmid is approximately 5230 base pairs. The complete plasmid sequence and map are provided on the BEI Resources webpage. The plasmid was produced in *E. coli* and extracted.

Non-structural protein 10 is a non-structural protein located within the SARS-CoV-2 ORF1ab and is required for viral replication. It has been shown to stimulate the activity of two methyl transferases, Nsp14 and Nsp16, resulting in the production of a viral RNA cap that prevents the activation of the host innate immune response.<sup>5,6</sup>

**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 expression studies.

**Packaging/Storage:**

NR-52425 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 Non-Structural Protein 10 Gene, NR-52425, 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/bmb15/index.htm](http://www.cdc.gov/biosafety/publications/bmb15/index.htm).

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**References:**

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6. Wang, Y., et al. "Coronavirus Nsp10/Nsp16 Methyltransferase can be Targeted by Nsp10-Derived Peptide *in vitro* and *in vivo* to Reduce Replication and Pathogenesis." J. Virol. 89 (2015): 8416-8427. PubMed: 26041293.

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