

SARS-Related Coronavirus 2, Isolate hCoV-19/USA/CA-Stanford-109_S21/2022 (Lineage XBB; Omicron Variant)

Catalog No. NR-58925

For research use only. Not for use in humans.

Contributor:

Mehul Suthar, Ph.D., Assistant Professor, Vaccine Center, Emory University, Atlanta, Georgia, USA

Manufacturer:

BEI Resources

Product Description:

Virus Classification: *Coronaviridae, Betacoronavirus*

Species: Severe acute respiratory syndrome-related coronavirus 2

Strain/Isolate: hCoV-19/USA/CA-Stanford-109_S21/2022

Original Source: Severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2), isolate hCoV-19/USA/CA-Stanford-109_S21/2022 was isolated from a human on October 10, 2022, in California, USA.¹

Note: Genome sequence information is provided on the Certificate of Analysis and includes an analysis of all sequence variations observed for each lot.

Comments: Under the nomenclature system introduced by GISAID (Global Initiative on Sharing All Influenza Data), SARS-CoV-2, isolate hCoV-19/USA/CA-Stanford-109_S21/2022 is assigned lineage XBB (Pango v.4.1.3 consensus call), Omicron (B.1.1.529+BA.*) (Scorpio) and GISAID clade GRA using the Phylogenetic Assignment of Named Global Outbreak lineages (PANGO) tool.^{1,2,3} The complete genome of SARS-CoV-2, isolate hCoV-19/USA/CA-Stanford-109_S21/2022 has been sequenced (GISAID: EPI_ISL_15509864).^{1,2} The following mutations are present in the clinical isolate: Spike A27S, Spike D405N, Spike D614G, Spike D796Y, Spike E484A, Spike F486S, Spike F490S, Spike G142D, Spike G339H, Spike G446S, Spike H146K, Spike H655Y, Spike K417N, Spike L24del, Spike L368I, Spike N440K, Spike N460K, Spike N501Y, Spike N679K, Spike N764K, Spike N969K, Spike P25del, Spike P26del, Spike P681H, Spike Q183E, Spike Q498R, Spike Q954H, Spike R346T, Spike R408S, Spike S371F, Spike S373P, Spike S375F, Spike S477N, Spike T19I, Spike T376A, Spike T478K, Spike V83A, Spike V213E, Spike V445P, Spike Y144del, Spike Y505H, E (Envelope) T9I, E T11A, M (Membrane) A63T, M Q19E, N (Nucleocapsid) E31del, N G204R, N P13L, N R32del, N R203K, N S33del, N S413R, N S3 T223I, NS8 Q29L, NSP1 (Non-structural protein 1) G82D, NSP1 K47R, NSP1 S135R, NSP3 (Non-structural protein 3) G489S, NSP3 T24I, NSP4 (Non-structural protein 4) L264F, NSP4 L438F, NSP4 T327I, NSP4 T492I, NSP5 (Non-structural protein 5) P132H, NSP6 (Non-structural protein 6) F108del, NSP6 G107del, NSP6 S106del, NSP12 (Non-structural protein 12)

G671S, NSP12 P323L, NSP13 (Non-structural protein 13) R392C, NSP13 S36P, NSP14 (Non-structural protein 14) I42V, NSP15 (Non-structural protein 15) T112I.^{1,2} It was labeled as VOC Omicron GRA (B.1.1.529+BA.*), first detected in Botswana/Hong Kong/South Africa by the World Health Organization (WHO).^{1,4}

Note: One additional mutation, ORF6 D61L, was identified during sequence analysis, but is not annotated on the GISAID website.

In December 2019, an outbreak of a respiratory illness (COVID-19) began in Wuhan, Hubei Province, China. The outbreak is associated with a seafood market and although environmental samples from the market are positive for the novel coronavirus, an association with a particular animal has not been determined.⁵ SARS-CoV-2 has been isolated from patients from several countries and the sequences of some of these isolates have been deposited with GISAID.

Material Provided:

Each vial contains approximately 0.1 mL of spin-clarified cell lysate and supernatant from *Cercopithecus aethiops* kidney epithelial cells expressing transmembrane protease, serine 2 and human angiotensin-converting enzyme 2 (Vero E6-TMPRSS2-T2A-ACE2; VTA) infected with SARS-CoV-2, isolate hCoV-19/USA/CA-Stanford-109_S21/2022.

Note: If homogeneity is required for your intended use, please purify prior to initiating work.

Packaging/Storage:

NR-58925 was packaged aseptically in screw-capped plastic cryovials. The product is provided frozen and should be stored at -60°C or colder immediately upon arrival. For long-term storage, the vapor phase of a liquid nitrogen freezer is recommended. Freeze-thaw cycles should be avoided.

Growth Conditions:

Host: *Cercopithecus aethiops* kidney epithelial cells expressing transmembrane protease, serine 2 and human angiotensin-converting enzyme 2 (Vero E6-TMPRSS2-T2A-ACE2; VTA; BEI Resources NR-54970)

Growth Medium: Eagle's Minimum Essential Medium containing Earle's Balanced Salt Solution, non-essential amino acids, 2 mM L-glutamine, 1 mM sodium pyruvate and 1500 milligrams per liter of sodium bicarbonate supplemented with 2% fetal bovine serum, or equivalent

Infection: Cells should be 70% to 90% confluent

Incubation: 2 to 4 days at 37°C and 5% CO₂

Cytopathic Effect: Cell rounding and sloughing

Citation:

Acknowledgment for publications should read "The following reagent was obtained through BEI Resources, NIAID, NIH: SARS-Related Coronavirus 2, Isolate hCoV-19/USA/CA-Stanford-109_S21/2022 (Lineage XBB; Omicron Variant), NR-58925, contributed by Dr. Mehul Suthar."

Biosafety Level: 3

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.

Disclaimers:

You are authorized to use this product for research use only. This product is not intended for human use.

Use of this product is subject to the terms and conditions of the Emergency Use Simple Letter Agreement (EUSLA) and the BEI Resources Material Transfer Agreement (MTA). The MTA is available on our Web site at www.beiresources.org.

While BEI Resources uses reasonable efforts to include accurate and up-to-date information on this product sheet, neither ATCC® nor the U.S. Government makes any warranties or representations as to its accuracy. Citations from scientific literature and patents are provided for informational purposes only. Neither ATCC® nor the U.S. Government warrants that such information has been confirmed to be accurate.

This product is sent with the condition that you are responsible for its safe storage, handling, use and disposal. ATCC® and the U.S. Government are not liable for any damages or injuries arising from receipt and/or use of this product. While reasonable effort is made to ensure authenticity and reliability of materials on deposit, the U.S. Government, ATCC®, their suppliers and contributors to BEI Resources are not liable for damages arising from the misidentification or misrepresentation of products.

Use Restrictions:

SARS-CoV-2 materials provided by BEI Resources under the EUSLA are made available for any legitimate purpose, including commercial purposes as long as they are to rapidly prevent, detect, prepare for, and respond to, the spread or transmission of the 2019 SARS-CoV-2. Any further transfer of the original material or any unmodified progeny must be done under the terms of the EUSLA, documented as described above and you must notify BEI Resources of each subsequent transfer. Any new materials made by you that are not the original material or unmodified progeny are excluded from this requirement and you are free to share and commercialize those as your materials.

References:

1. [GISAID](#)
2. Rambaut, A., et al. "A Dynamic Nomenclature Proposal for SARS-CoV-2 Lineages to Assist Genomic Epidemiology." Nat. Microbiol. 5 (2020): 1403-1407. PubMed: 32669681.
3. Mercatelli, D. and F. M. Giorgi. "Geographic and Genomic Distribution of SARS-CoV-2 Mutations." Front. Microbiol.

(2020): doi.org/10.3389/fmicb.2020.01800. PubMed: 32793182.

4. [WHO](#)
5. Gralinski, L. E. and V. D. Menachery. "Return of the Coronavirus: 2019-nCoV." Viruses 12 (2020): 135. PubMed: 31991541.

ATCC® is a trademark of the American Type Culture Collection.

