

Twist Synthetic SARS-CoV-2 RNA Controls

The recent Coronavirus pandemic has led to the unprecedented need for diagnostic tests for detecting the presence of the SARS-CoV-2 virus in a variety of sample types. To address this need, laboratories around the world need high quality tools to enable them in catering to this rapidly expanding requirement for testing.

KEY HIGHLIGHTS

- Fully synthetic RNA generated from Twist gene fragments
- >99.9% viral genome coverage
- NGS sequence verified
- Positive control for both RT-PCR and NGS-based assays

Positive controls provide quality control measures for a wide range of applications from diagnostic assay development to day-to-day testing including the verification and validation of diagnostic tests of both next-generation sequencing (NGS) and reverse transcription polymerase chain reaction (RT-PCR) assays. Synthetic viral controls are a powerful alternative to “live virus” controls which are viral nucleic acids extracted from either an infected patient or from live virus propagated in cell culture. Synthetic controls created through gene synthesis broaden access across diverse strains while mitigating safety and security concerns.

The Twist Synthetic SARS-CoV-2 RNA controls consist of six non-overlapping 5 kb fragments generated from Twist Gene Fragments then transcribed into ssRNA. The Twist Synthetic SARS-CoV-2 RNA Controls provide coverage of greater than 99.9% of the bases of the viral genome. The RNA controls are supplied in 100 µL at a concentration of approximately one million copies per microliter.

Twist has created synthetic RNA controls from six sequence variants of the SARS-CoV-2 virus as shown in Table 1. These variants were selected to cover a wide range of sequence diversity of this evolving virus. Twist Synthetic RNA Control 2, MN908947.3, is one of the initial isolates of SARS-CoV-2 and serves as a reference sequence.

	GENBANK ID	GISAID NAME
Control 1	MT007544.1	Australia/VIC01/2020
Control 2	MN908947.3	Wuhan-Hu-1
Control 3	LC528232.1	Japan/Hu_DP_Kng_19-020/2020
Control 4	MT106054.1	USA/TX1/2020
Control 5	MT188340	USA/MN2-MDH2/2020
Control 6	MT118835	USA/CA9/2020

Table 1: GenBank IDs and GISAID Name for synthetic controls 1 through 6.

The six variant sequences differ from each other at several locations along the viral genome as shown in Figure 1. For a wide range of applications, these synthetic RNA controls serve as sequence diverse position controls mimicking diversity found globally as this virus evolves.

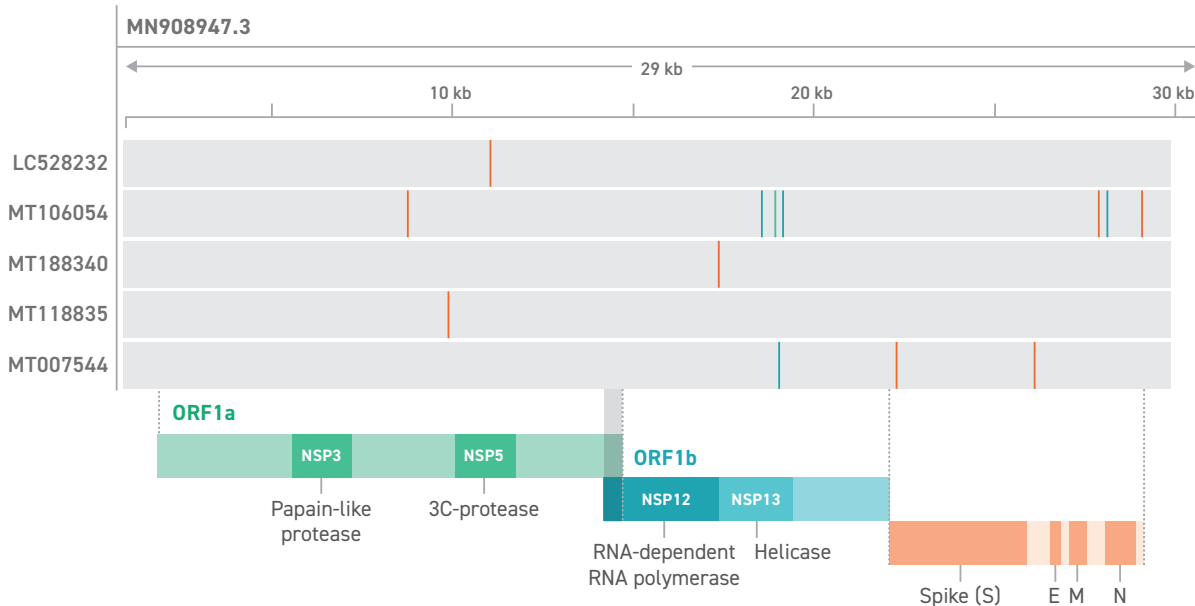


Figure 1: Genome browser view showing the nucleotide variations among the 6 isolates. Five of the strains were mapped to the reference isolate (MN908947.3). The colored lines indicate SNPs where Red is a “T”, Orange is a “G”, Green is an “A” and Blue is a “C”. The box diagram overlays the approximate location of the SNPs on top of the ORF/Gene structure of the virus.

At present, there are thousands of variants of the SARS-CoV-2 virus available in public repositories. Leveraging our powerful silicon-base writing platform, Twist is able to manufacture and deliver customized synthetic viral genome controls based on viral reference sequences within approximately two weeks. Customers purchasing synthetic controls are subject to Twist’s leading biosecurity screening protocols and applicable laws and regulations.



BIOSAFETY
LEVEL 1



STORAGE TEMP
-70°C TO -90°C



SPECIFICATION RANGE
APPROXIMATELY
1 X 10⁶ COPIES/μL

Twist Synthetic SARS-CoV-2 RNA controls are a component of the Twist Infectious Disease portfolio of products.

LEARN MORE

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ORDERING INFORMATION FOR TWIST SYNTHETIC SARS-COV-2 RNA CONTROLS

- 102019:** Control 1 (MT007544.1)
- 102024:** Control 2 (MN908947.3)
- 102860:** Control 3 (LC528232.1)
- 102862:** Control 4 (MT106054.1)
- 102917:** Control 5 (MT188340)
- 102918:** Control 6 (MT118835)
- 102916:** Controls (1–6)