# Nucleocapsid SARS CoV-2 mRNA
## (mRNA encoding nucleocapsid (N) protein of SARS-CoV-2 virus)

## Description

Ready-to-use stabilized N SARS CoV-2 mRNA.
**Cap Modification:** Cap 1 | **Poly (A) Tail:** Yes
**Concentration:** 1.0 mg/mL
**Buffer:** 1 mM Sodium Citrate, pH 6.4
**Full length mRNA:** 1474 nt
**Molecular weights:** #**MRNA52:** 475220 g/mol; #**MRNA53:** 483860 g/mol; #**MRNA54**: 479540 g/mol

N SARS CoV-2 mRNAs have been designed to produce high expression level of the nucleocapsid protein of SARS-CoV-2 virus. OZB mRNAs are produced by *in vitro* transcription. mRNAs are stabilized at the 5' end by modified nucleotides capping (Cap1) and contain a poly(A) tail at the 3' end. Sequences have been optimized to yield improved stability and performance. N protein of SARS-CoV-2 virus mRNA #**MRNA52** does not bear any additional nucleotide modifications while #**MRNA53** is modified with 5-methoxyuridine (5moU), #**MRNA54** is modified with N1-methyl-pseudouridine (N1-mψ) to reduce innate immune response.

## Applications

Like other coronaviruses, the nucleocapsid (N) protein is one of the most crucial structural components of SARS-CoV-2. N protein is a multifunctional RNA-binding protein, which is not only responsible for packaging viral genomes but also regulates the innate immune response caused by viral infection[1]. While, spike mutations have dominated SARS-CoV-2 variant research, owing to concerns that they enhance replication, augment transmission, or allow escape from immunity, less attention has been focused on the SARS-CoV-2 nucleocapsid (N) gene (Plante JA 2021).
This mRNA encodes for the N protein of the SARS-CoV-2 virus.

1. Bai Z., *et al.*, Viruses., 2021. DOI:10.3390/v13061115.
2. Plante JA., et al., Cell Host Microbe., 2021. DOI:10.1016/j.chom.2021.02.020.

## General considerations on OZB's mRNA

N SARS CoV2 mRNAs resemble fully matured mRNAs with 5'cap1 structure and 3' polyA tail, therefore ready to be translated by the ribosome. mRNA transfection provides several advantages over plasmid DNA (pDNA) delivery. It does not require nuclear uptake for being expressed since translation of mRNA occurs directly into cytoplasm. Indeed, nuclear delivery (transport through nuclear membrane) is one the principal barriers for transfecting slow or non-dividing cells and consequently, mRNA transfection is particularly attractive for such purpose. This approach presents also the advantage of being non-integrative which is particularly appealing for stem cells, regenerative medicine or vaccine fields. Contrary to pDNA, mRNA cannot lead to genetic insertion causing mutations. Moreover, the protein expression from the mRNA is promoter-independent and faster than with DNA. For transfection we recommend RmesFect™ (#RM21000) and RmesFect™ Stem (#RS31000).

## Quality Controls

| Items | Specification | Standard QC | Superior Grade QC* |
|---|---|---|---|
| *Integrity* | Agarose gel mobility and fragment analyzer | ✓ | ✓ |
| *Concentration* | 1mg/ml +/- 5% | ✓ | ✓ |
| *A260/280* | >1.8 for Unmodified mRNAs<br>>1.7 for chemically modified mRNAs | ✓ | ✓ |
| *Sterility* | Absence of bacterial growth at 37°C | ✓ | ✓ |
| *Endotoxin* | <0.5 EU/mL | | ✓ |
| *dsRNA* | <0.5% | | ✓ |

* Our catalogue mRNAs undergo the standard QC. Superior Grade QC can be performed as an additional prestation.

Certificate of analysis on demand.

## Use, handling and storage

*For Research Use Only. Not for use in humans. Not for use in diagnostic or therapeutic purposes.*

**Long term storage (months):** -80°C.

**Short term storage (few days):** -20°

We recommend to aliquot the mRNA solution for a better storage. Follow good laboratory practices for mRNA handling (work on ice, avoid freeze/thaw cycles, do not vortex, use RNAse free water and barrier tips, …)

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## mRNA Stability

RNA can suffer degradation when not handled, stored, or used properly. In order to assess the stability of OZ Biosciences mRNAs, we have tested a randomly chosen RNA from our catalog and submitted it to several freeze/thaw cycles as well as a 15-day storage at room temperature (RT). mRNA did not show any sign of degradation in any condition as observed on agarose gel (*cf* Stability note available on our website).

## Kit contents

**N SARS CoV-2 mRNAs -20:** 20 µg of mRNA.
**N SARS CoV-2 mRNAs -100:**100 µg mRNA.
**N SARS CoV-2 mRNAs -1000:** 1 mg of mRNA.

## Related Products

| Ref | Description |
|---|---|
| #**RM20500/21000** | RmesFect™ transfection reagent (mRNA) |
| #**RS30500/31000** | RmesFect™ Stem transfection reagent (mRNA) |
| #**MRNA11/15/22** | mRNA GFP unmodified or 5moU or N1-mpU |
| #**MRNA12/16/24** | mRNA LUC unmodified or 5moU or N1-mpU |
| #**MRNA40/41/42** | mRNA OVA unmodified or 5moU or N1-mpU |
| #**MRNA34/35/43** | mRNA spike SARS Cov2 unmodified or 5moU or N1-mpU |
| #**MRNA36/37/45** | mRNA Spike Delta SARS-CoV-2 unmodified or 5moU or N1-mpU |
| #**MRNA38/39/44** | mRNA Spike Omicron SARS-CoV-2 unmodified or 5moU or N1-mpU |
| #**MRNA38/39/44** | mRNA Spike Omicron SARS-CoV-2 unmodified or 5moU or N1-mpU |
| #**MRNA46/47/48** | mRNA HA-H1N1 unmodified or 5moU or N1-mpU |
| #**MRNA67/68/69** | mRNA HA(FL)-H1N1 unmodified or 5moU or N1-mpU |

**Custom mRNAs are also available now!**

## Purchaser Notification | Conditions of Sale

This product is sold in accordance with our general conditions of sale that you can find on our website: https://ozbiosciences.com/content/3-terms-and-conditions.