

# HA(FL)-H1N1 mRNA

## (mRNA encoding full length hemagglutinin (HA) of H1N1 subtype of Influenza A virus (A/California/04/2009(H1N1))

### Description

Ready-to-use stabilized H1N1 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:** 1919 nt

**Molecular weights:** #**MRNA67**: 621140 g/mol; #**MRNA68**:

629120 g/mol; #**MRNA69**: 625130 g/mol

**Coding sequence:** 566 aa.

HA(FL)-H1N1 mRNAs have been designed to produce high expression level of the (HA) hemagglutinin surface glycoproteins. 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. HA protein of H1N1 subtype of flu A virus mRNA #**MRNA67** does not bear any additional nucleotide modifications while #**MRNA68** is modified with 5-methoxyuridine (5moU), #**MRNA69** is modified with N1-methyl-pseudouridine (N1-mψ) to reduce innate immune response.

### Applications

Influenza A viruses (IAV) can infect humans, birds, pigs, horses and other animals while influenza B and C viruses are only found in humans. IAV are subtyped according to their surface glycoproteins hemagglutinin (HA) and neuraminidase (NA). Currently there are 18 known subtypes of HA (H1–18) and 11 of NA (N1–11), but only a limited number of these i.e., H1N1, H3N2, and H3N3, currently circulate in humans<sup>1</sup>.

This mRNA encodes for the Hemagglutinin protein of the H1N1 flu virus. The function of hemagglutinin is to cause red blood cells to cluster together, and it attaches the virus to the infected cell. HA is a major influenza surface glycoprotein that is considered an important target to generate broad protection against influenza and is the primary target of currently developing influenza vaccines. HA protein could be used as antigen for immunization and biochemical studies.

1. Shim JM., et al., Viruses., 2017. DOI:10.3390/v9080223.

### General considerations on OZB's mRNA

HA(FL)-H1N1 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*
<i>Integrity</i>	Agarose gel mobility and HPLC	✓	✓
<i>Concentration</i>	1mg/ml +/- 5%	✓	✓
<i>A260/280</i>	>1.8 for Unmodified mRNAs >1.7 for chemically modified mRNAs	✓	✓
<i>Sterility</i>	Absence of bacterial growth at 37°C	✓	✓
<i>Endotoxin</i>	<0.5 EU/mL		✓
<i>dsRNA</i>	<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, ...)

## 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

**HA(FL)-H1N1 mRNAs-20:** 20 µg of mRNA.  
**HA(FL)-H1N1 mRNAs-100:** 100 µg mRNA.  
**HA(FL)-H1N1 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
#MRNA46/47/48	mRNA HA-H1N1 unmodified or 5moU or N1-mpU
#MRNA49/50/51	mRNA HA-H3N2 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>.