

Description

Ready-to-use stabilized IFN- α 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: 785 nt

Molecular weights: #**MRNA95**: 254470 g/mol; #**MRNA96**: 258010 g/mol; #**MRNA97**: 256240 g/mol

IFN mRNAs have been designed to produce high expression level of IFN protein. 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. IFN- α mRNA #**MRNA95** does not bear any additional nucleotide modifications while #**MRNA96** is modified with 5-methoxyuridine (5moU), #**MRNA97** is modified with N1-methyl-pseudouridine to reduce innate immune response.

Applications

The encoded cytokine is a member of the type I interferon family that is produced in response to viral infection as a key part of the innate immune response with potent antiviral, antiproliferative and immunomodulatory properties¹. The type I IFNs represent a family of several closely related subtypes. At least 8 subclasses: α , β , δ , ϵ , κ , τ , ω and limitin have been described in different mammalian species. They all act through the same plasma membrane receptor made of IFNAR1 and IFNAR2. Humans have 17 subtypes: 13 α , 1 β , 1 ω , 1 ϵ and 1 κ^2 .

IFNA2, like other type I interferons, binds a plasma membrane receptor made of IFNAR1 and IFNAR2 that is ubiquitously expressed, and thus is able to act on virtually all body cells. The encoded protein is effective in reducing the symptoms and duration of the common cold and in treating many types of cancer. Indeed, in human, IFNA2 has the longest record of clinical use for the treatment of many types of cancer, including some hematological malignancies and solid tumors³. A deficiency of type I interferon in the blood is thought to be a hallmark of severe COVID-19 and may provide a rationale for a combined therapeutic approach⁴.

1. Paul F, *et al.*, *Gene.*, 2015, Aug 10;567(2):132-7.

2. Pestka S, *et al.*, *Immunol Rev.*, 2004 Dec;202:8-32.

3. Antonelli G *et al.*, *Cytokine Growth Factor Rev.* 2015, Apr;26(2):121-3.

4. Hadjadj J *et al.*, *Science.*, 2020 Aug 7;369(6504):718-724.

General considerations on OZB's mRNA

IFN 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 fragment analyzer	✓	✓
<i>Concentration</i>	1mg/ml +/- 5%	✓	✓
<i>A260/280</i>	>1.8 for Unmod, >1.7 for modified	✓	✓
<i>Sterility</i>	Absence of growth after 14 days	✓	✓
<i>Endotoxin</i>	<0.5 EU/mL		✓
<i>dsRNA</i>	<0.5%		✓
<i>Functionality</i>	protein expression after transfection	✓	✓

* our catalogue mRNA 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°C.

We recommend to aliquot the mRNA solution for a better storage and to work on ice. Follow good laboratory practices for mRNA handling (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 use properly. In order to assess how stable are OZ Biosciences mRNA, we have tested a randomly chosen RNA from our catalog, and submitted it to several freeze/thaw cycles as well as a 15 days storage at room temperature (RT). mRNA did not show any sign of degradation in both experiments (cf Stability note available on our website).

Kit contents

IFN- α mRNAs-20: 20 μ g of mRNA.

IFN- α mRNAs-100: 100 μ g mRNA.

IFN- α 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
#MRNA98/99/100	mRNA INF- γ unmodified or 5moU or N1-mpU
#MRNA92/93/94	mRNA TGF- α unmodified or 5moU or N1-mpU
#MRNA89/90/91	mRNA TGF- β unmodified or 5moU or N1-mpU
#MRNA101/102/103	mRNA TNF- α unmodified or 5moU or N1-mpU

Custom mRNAs are also available now!