

## Description

Ready-to-use stabilized TP53 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:** 1403 nt

**Molecular weights:** #MRNA121: 453770 g/mol; #MRNA122:

458690 g/mol; #MRNA123: 456230 g/mol

TP53 mRNAs have been designed to produce high expression level of TP53 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. TP53 mRNA #MRNA121 does not bear any additional nucleotide modifications while #MRNA122 is modified with 5-methoxyuridine (5moU), #MRNA123 is modified with N1-methyl-pseudouridine to reduce innate immune response.

## Applications

The tumour suppressor, p53, has been classified as a 'guardian of the genome'<sup>1</sup>. TP53 is a sequence-specific transcription factor that binds to specific response elements, which comprise two half sites of the nucleotide sequence RRRCWWGYYY (in which R = purine, W = A or T, and Y = pyrimidine), typically separated by a 0–13 nucleotide spacer. The major TP53 isoforms (TP53 alpha or P1, 393 aa) comprise several domains that are responsible for sequence-specific DNA binding, transcriptional activation and tetramerization. TP53 $\alpha$  is predominantly nuclear and its activity regulated by multiple post-translational modifications. The p53 protein acts as a central hub that receives, integrates and transmits multiple signals, generated during various stress events, to ensure cell and tissue homeostasis. Although the most important activity of p53 is to act as a direct transcription activator for several hundreds of genes, it is also able to act as a transcription repressor. Moreover, it has several transcription-independent activities that make the investigation of this protein very complex. The strongest and most undisputed fact about p53 is the high frequency of TP53 gene alterations in human cancer and the tumor suppressor function of p53 has generally been associated with the induction of cell-cycle arrest, apoptosis, or senescence. Mutations in this gene are associated with a variety of human cancers, including hereditary cancers such as Li-Fraumeni syndrome.

1-Lane, D. p53, guardian of the genome. *Nature* **358**, 15–16 (1992).  
<https://doi.org/10.1038/358015a0>

## General considerations on OZB's mRNA

TP53 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 of 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 aliquoting 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

**TP53 mRNAs-20:** 20 µg of mRNA.

**TP53 mRNAs-100:** 100 µg mRNA.

**TP53 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
#MRNA124/125/126	mRNA PD-L1 unmodified or 5moU or N1-mpU
#MRNA127/128/129	mRNA P95HER2 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>.