c-Myc mRNA
(mRNA encoding human MYC proto-oncogene)

Description

Ready-to-use stabilized c-Myc 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: 1584 nt
Molecular weights: #**MRNA58:** 512800 g/mol; #**MRNA59:** 518800 g/mol; #**MRNA60**: 515800 g/mol

c-Myc mRNAs have been designed to produce high expression level of c-Myc 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. C-Myc mRNA #**MRNA58** does not bear any additional nucleotide modifications while #**MRNA59** is modified with 5-methoxyuridine (5moU), #**MRNA60** is modified with N1-methyl-pseudouridine to reduce innate immune response.

Applications

c-Myc belongs to the basic Helix-Loop-Helix (*bHLH*) family of proteins[1]. These proteins are transcription factors that play important roles during the development of various metazoans. They are also involved in human diseases, particularly in cancerogenesis. Indeed, c-Myc is a proto-oncogene. It encodes a nuclear phosphoprotein that plays a role in cell cycle progression, apoptosis and cellular transformation. C-Myc forms a heterodimer with the related transcription factor MAX; this complex binds to the E box DNA consensus sequence and regulates the transcription of specific target genes. Amplification of this gene is frequently observed in numerous human cancers[2]. Translocations involving this gene are associated with Burkitt lymphoma and multiple myeloma in human patients. It has been reported that translation initiates both from an upstream, in-frame non-AUG (CUG) and a downstream AUG start site, resulting in the production of two isoforms with distinct N-termini.
c-Myc has also been described to enhance the reprogramming of somatic cells to the pluripotent state together with other genes OCT3/4, SOX2, KLF4. Their ectopic expression induces pluripotent stem cells (iPSC)[3].

1. Ledent V., *et al.*, Genome Res., 2001. DOI:10.1101/gr.177001.
2. Dhanasekaran R., *et al.*, Nat Rev Clin Oncol., 2022. DOI:10.1038/s41571-021-00549-2.
3. Karagiannis P., *et al.*, Phys Rev., 2019. DOI:10.1152/physrev.00039.2017.

General considerations on OZB's mRNA

c-Myc 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 HPLC	✓	✓
Concentration	1mg/ml +/- 5%	✓	✓
A260/280	>1.8 for Unmodified mRNAs >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

c-Myc mRNAs-20: 20 µg of mRNA.
c-Myc mRNAs-100: 100 µg mRNA.
c-Myc 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
#**MRNA61/62/63**	mRNA SOX2 unmodified or 5moU or N1-mpU
#**MRNA64/65/66**	mRNA Nanog unmodified or 5moU or N1-mpU
#**MRNA80/81/82**	mRNA KLF4 unmodified or 5moU or N1-mpU
#**MRNA83/84/85**	mRNA OCT4 unmodified or 5moU or N1-mpU
#**MRNA86/87/88**	mRNA LIN28 unmodified or 5moU or N1-mpU

Custom mRNAs are also available now!

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