

Description

Ready-to-use stabilized KLF4 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: 1760 nt

Molecular weights: #MRNA80: 566910 g/mol; #MRNA81:

573840 g/mol; #MRNA82: 570375 g/mol

KLF4 mRNAs have been designed to produce high expression level of KLF4 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. KLF4 mRNA #MRNA80 does not bear any additional nucleotide modifications while #MRNA81 is modified with 5-methoxyuridine (5moU), #MRNA82 is modified with N1-methyl-pseudouridine to reduce innate immune response.

Applications

This gene encodes a protein that belongs to the Krüppel family of transcription factors. The encoded zinc finger protein is required for normal development of the barrier function of skin. The encoded protein is thought to control the G1-to-S transition of the cell cycle following DNA damage by mediating the tumor suppressor gene p53. OZB mRNA KLF4 encodes the longer isoform. The corresponding protein consists of 513 amino acids, and contains both transcriptional activation and suppression domains, which bind specifically to a responsive element containing the CCACC core sequence¹. KLF4 regulates a large number of genes and biological factors involved in proliferation, differentiation and apoptosis and crucially regulates the development and progression of various types of tumors^{2,3}.

As one of the Yamanaka factors (OSKM, OCT3/4, SOX2, KLF4 and c-MYC), KLF4 is best known for its role in maintaining the stemness of embryonic stem cells and inducing the formation of induced pluripotent stem cell (iPSC)⁴.

1. Yu K., *et al.*, Cardiovasc Res., 2011. DOI:10.1093/cvr/cvr017.

2. Taracha-Wisniewska T., *et al.*, Int J Mol Sci., 2020.

DOI:10.3390/ijms21228843

3. He Z., *et al.*, Cell Death Discov., 2023. DOI:10.1038/s41420-023-01416-y.

4. Zhang P., *et al.*, J Biol Chem., 2010. DOI:10.1074/jbc.M109.077958.

General considerations on OZB's mRNA

KLF4 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 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

KLF4 mRNAs-20: 20 µg of mRNA.

KLF4 mRNAs-100: 100 µg mRNA.

KLF4 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
#MRNA58/59/60	mRNA c-Myc 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
#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!

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>.