

Description

Ready-to-use stabilized LIN28 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: 848 nt

Molecular weights: #MRNA86: 275080 g/mol; #MRNA87: 278320 g/mol; #MRNA88: 276700 g/mol

LIN28 mRNAs have been designed to produce high expression level of LIN28 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. LIN28 mRNA #MRNA86 does not bear any additional nucleotide modifications while #MRNA87 is modified with 5-methoxyuridine (5moU), #MRNA88 is modified with N1-methyl-pseudouridine to reduce innate immune response.

Applications

The highly conserved RNA-binding proteins Lin28 are important regulators of cellular functions such as development, differentiation, pluripotency, and glucose metabolism¹. The mammalian genome encodes two Lin28 paralogs, (Lin28A and Lin28B) that have a high degree of sequence identity and conserved domain organization, and both proteins selectively block let-7 expression. Lin28 (Lin28a) and its paralogue Lin28b are important reprogramming factors expressed during embryonic development and are associated to pluripotency.

OZB mRNA encodes Lin28(A), that functions through direct interaction with target mRNAs and by disrupting the maturation of certain miRNAs involved in embryonic development. This protein prevents the terminal processing of the LET7 family of microRNAs which are major regulators of cellular growth and differentiation². With NANOG, LIN28 has been shown to synergize with OCT4, SOX2, KLF4 and MYC (OSKM) to improve and shorten cell reprogramming^{3,4}. Aberrant expression of LIN28 is associated with cancer progression in multiple tissues. Lin28A/Lin28B functions as oncogenes that promote cellular transformation when ectopically expressed⁵. While Lin28 is generally not present in mature tissues, Lin28 is re-expressed in several cancers to support cancer cell growth and resistance to cancer therapies⁶.

1. Balzeau J., *et al.*, Front Genet., 2017. DOI:10.3389/fgene.2017.00031.
2. Zhang J., *et al.*, Cell Stem Cell., 2016. DOI:10.1016/j.stem.2016.05.009.
3. Yu J., *et al.*, Science., 2007. DOI:10.1126/science.1151526.
4. Wang L., *et al.*, Biol Open., 2019. DOI:10.1242/bio.047225.
5. West JA., *et al.*, Nature., 2009. DOI:10.1038/nature08210.
6. Peng S., *et al.*, Oncogene., 2010. DOI:10.1038/onc.2009.500.

General considerations on OZB's mRNA

LIN28 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, ...)

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

LIN28 mRNAs-20: 20 µg of mRNA.

LIN28 mRNAs-100: 100 µg mRNA.

LIN28 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
#MRNA80/81/82	mRNA KLF4 unmodified or 5moU or N1-mpU
#MRNA83/84/85	mRNA OCT4 unmodified or 5moU or N1-mpU

Custom mRNAs are also available now!

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