OCT4 mRNA

(mRNA encoding human Oct-4 (octamer-binding transcription factor 4), also known as POU5F1 (POU domain, class 5, transcription factor 1)

Description

Ready-to-use stabilized OCT4 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: 1300 nt

Molecular weights: #**MRNA83:** 420980 g/mol; #**MRNA84:** 426170 g/mol; #**MRNA85**: 423665 g/mol

OCT4 mRNAs have been designed to produce high expression level of OCT4 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. OCT4 mRNA #**MRNA83** does not bear any additional nucleotide modifications while #**MRNA84** is modified with 5-methoxyuridine (5moU), #**MRNA85** is modified with N1-methyl-pseudouridine to reduce innate immune response.

Applications

OCT4 (POU5F1) protein belongs to a family of eukaryotic transcription factors that have well-conserved POU homeodomain, a bipartite DNA binding domain. The various members of the POU (Pit-Oct-Unc) family have a wide variety of functions, all of which are related to the function of the neuroendocrine system and the development of an organism[1]. OCT4 (POU5F1) plays a key role in embryonic development and stem cell pluripotency. The aberrant expression of this gene in adult tissues is associated with tumorigenesis. This gene can participate in a translocation with the Ewing's sarcoma gene on chromosome 21, which also leads to tumor formation[2].

It is critically involved in the self-renewal of undifferentiated embryonic stem cells[3]. As such, it is frequently used as a marker for undifferentiated cells. Oct-4 expression must be closely regulated; too much or too little will cause differentiation of the cells[4]. It has been noted that OCT-4 not only maintains pluripotency in embryonic cells but also has the ability to regulate cancer cell proliferation and can be found in various cancers such as pancreatic, lung, liver and testicular germ cell tumors in adult germ cells[5].

1. Latchman DS., *et al.* J Cell Physiol., 1999. DOI:10.1002/(SICI)1097-4652(199905)179:2.
2. Shenoy N., *et al.*, Cancer., 2020. DOI:10.1002/cncr.33220.
3. Boyer LA., *et al.*, Cell., 2005. DOI:10.1016/j.cell.2005.08.020.
4. Niwa H., *et al.*, Nat Genet., 2000. DOI:10.1038/74199.
5. Saha SK., *et al.*, Sci Rep., 2018. DOI:10.1038/s41598-018-33094-7.

General considerations on OZB's mRNA

OCT4 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, …)

Rev 05/26 CS

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

OCT4 mRNAs-20: 20 µg of mRNA.
OCT4 mRNAs-100: 100 µg mRNA.
OCT4 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
#**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.