Nanog mRNA
(mRNA encoding human Nanog homeobox transcription factor)

Description

Ready-to-use stabilized Nanog 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: 1136 nt
Molecular weights: #**MRNA64:** 367440 g/mol; #**MRNA65:** 371670 g/mol; #**MRNA66**: 369555 g/mol

Nanog mRNAs have been designed to produce high expression level of Nanog protein. OZB mRNAs are produced by *in vitro* transcription. mRNAs are stabilized with UTRs, a Cap1 structure at the 5' end, and contain a poly(A) tail at the 3' end. Sequences have been optimized (codon optimization) to yield improved performance. Nanog mRNA #**MRNA64** does not bear any additional nucleotide modifications while #**MRNA65** is modified with 5-methoxyuridine (5moU), #**MRNA66** is modified with N1-methyl-pseudouridine to reduce innate immune response.

Applications

The protein encoded by this gene is a DNA binding homeobox transcription factor. NANOG is a key transcriptional regulator of pluripotent stem cell (PSC), that is involved in embryonic stem (ES) cell proliferation, renewal, and pluripotency. It can block ES cell differentiation and can also auto repress its own expression in differentiating cells[1]. NANOG, a versatile master transcription factor globally influences gene regulation during developmental processes[2]. NANOG might be useful in cell replacement therapies for the treatment of several degenerative diseases. Nanog is known to play a role in somatic cell reprogramming, termed induced pluripotent stem (iPS) cells[3,4]. Nanog upregulation has a substantial association with the advanced stages and poor prognosis of malignancies playing a pivotal role through tumorigenesis of multiple human cancers. NANOG is involved in stemness, self-renewal, metastasis, invasiveness, and chemoresistance of cancer cells[5].

1. Wang Z. *et al.*, Cell Stem Cell, 2012. DOI:10.1016/j.stem.2012.02.016.
2. Heurtier V., *et al.*, Nat Commun, 2019. DOI:10.1038/s41467-019-09041-z
3. Moon JH., *et al.*, BBRC, 2013. DOI:10.1016/j.bbrc.2012.12.149.
4. Mitsui K., *et al.*, Cell, 2003. DOI:10.1016/s0092-8674(03)00393-3.
5. Vasefifar P., *et al.*, Gene, 2022. doi.org/10.1016/j.gene.2022.146448.

General considerations on OZB's mRNA

Nanog 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

Nanog mRNAs-20: 20 µg of mRNA.
Nanog mRNAs-100: 100 µg mRNA.
Nanog 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
#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!

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.