

# Cas9 mRNA

(mRNA encoding Cas9 *S. pyogenes* protein with 2 NLS and an HA-Tag)

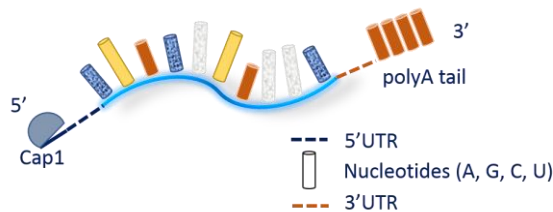
## Description

Ready-to-use stabilized Cas9 mRNA  
 Concentration: 1.0 mg/mL in 1mM sodium Citrate (pH 6.4).  
 mRNA length: 4459 nt. MW **MRNA30**= 1444890 g/mol; **MRNA31**= 1461600 g/mol; **MRNA25**=1453245 g/mol.

Cas 9 mRNAs encode the CRISPR associated (Cas) protein 9 (Cas9) protein of the *Streptococcus pyogenes* with an N and C terminal nuclear localization signal (NLS), and a HA-Tag on the 3' end. 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. Cas9 mRNA **#MRNA30** does not bear any additional nucleotide modifications while **#MRNA31** is modified with 5-methoxyuridine (5moU), **#MRNA25** is modified with N1-methyl-pseudouridine (N1-mψ) to reduce innate immune response.

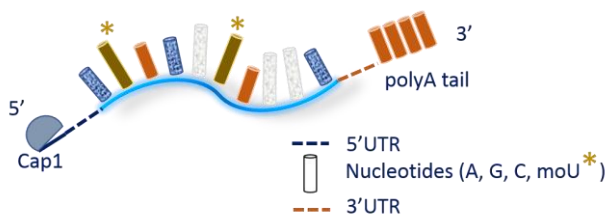
(ref# **MRNA30**):

Mature mRNA (unmodified nucleotides) with cap1 and polyA tail



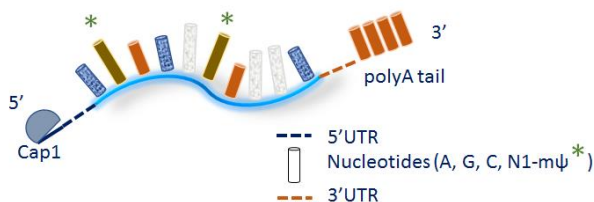
(ref# **MRNA31**):

Mature mRNA (fully modified moU) with cap1 and polyA tail



(ref# **MRNA25**):

Mature mRNA (fully modified N1-mψ) with cap1 and polyA tail



## Applications

The mRNA Cas9 encodes for the RNA-guided Cas9 endonuclease used to induce site-directed double strand breaks in DNA. These breaks can lead to gene inactivation or introduction of heterologous genes through non-homologous end joining and homologous recombination respectively, providing efficient tool for Genome Editing<sup>1-4</sup>.

**For Research Use Only. Not for use in humans. Not for use in diagnostic or therapeutic purposes.**

Cas9 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).

1. Cong L. *et al*, Science. 2013;339 (6121):819-823.
2. Mali P. *et al*, Science. 2013;339 (6121):823-826.
3. Jinek M. *et al*, Science. 2012;337 (6096):816-821.
4. Cho SW. *et al*, Nat Biotechnol. 2013;31(3):230-232.

## Kit contents

**Cas9 mRNAs-20:** 20 µg of mRNA unmodified or modified.  
**Cas9 mRNAs-100:** 100 µg of mRNA unmodified or modified.  
**Cas9 mRNAs-1000:** 1 mg of mRNA unmodified or modified.

## Storage

**Cas9 mRNAs must be stored at -80°C.** We recommend to aliquot the mRNA solution for a better storage.

### OZ Biosciences SAS

163 avenue de Luminy  
 Case 922, zone entreprise  
 13288 Marseille cedex 09 - FRANCE  
 Ph: +33 (0) 486 948 516  
 Fax: +33 (0) 486 948 515  
[contact@ozbiosciences.com](mailto:contact@ozbiosciences.com)  
[order@ozbiosciences.com](mailto:order@ozbiosciences.com)

### OZ Biosciences USA Inc.

7975 Dunbrook Road, Suite B,  
 San Diego,  
 CA 92126-USA  
 Ph : + 1-858-246-7840  
 Fax : + 1-855-631-0626  
[contactUSA@ozbiosciences.com](mailto:contactUSA@ozbiosciences.com)  
[orderUSA@ozbiosciences.com](mailto:orderUSA@ozbiosciences.com)

## Related Products

Ref	Description
MRNA26	mRNA CRE (N1-mψ)
MRNA32	mRNA CRE (5moU)
MRNA33	mRNA CRE unmod
MRNA27	mRNA Cas13d
MRNA28	mRNA Cas13d (5moU)
MRNA29	mRNA Cas13d (N1-mψ)
RM21000	RmesFect™ transfection reagent 1mL
RS31000	RmesFect™ Stem transfection reagent 1mL

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Technical questions: [tech@ozbiosciences.com](mailto:tech@ozbiosciences.com)  
Order: [order@ozbiosciences.com](mailto:order@ozbiosciences.com)  
General Information: [contact@ozbiosciences.com](mailto:contact@ozbiosciences.com)

### OZ Biosciences SAS

163 avenue de Luminy  
Case 922, zone entreprise  
13288 Marseille cedex 09 - FRANCE  
Ph: +33 (0) 486 948 516  
Fax: +33 (0) 486 948 515  
[contact@ozbiosciences.com](mailto:contact@ozbiosciences.com)  
[order@ozbiosciences.com](mailto:order@ozbiosciences.com)

### OZ Biosciences USA Inc.

7975 Dunbrook Road, Suite B,  
San Diego,  
CA 92126-USA  
Ph : + 1-858-246-7840  
Fax : + 1-855-631-0626  
[contactUSA@ozbiosciences.com](mailto:contactUSA@ozbiosciences.com)  
[orderUSA@ozbiosciences.com](mailto:orderUSA@ozbiosciences.com)