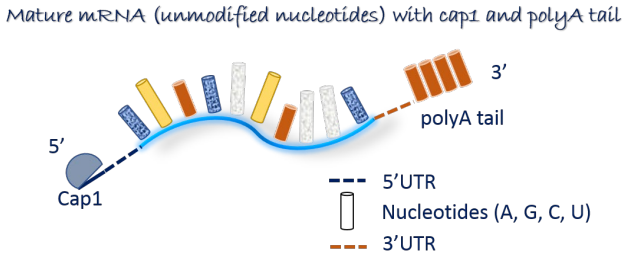
Cas13d mRNA
(mRNA encoding Cas13 protein)

Description

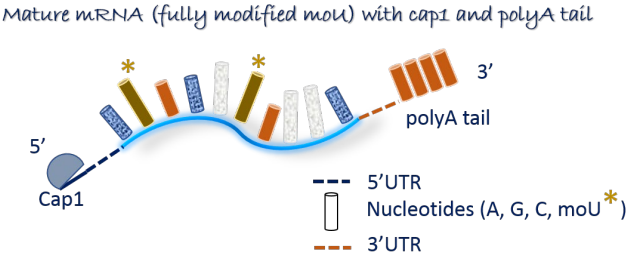
Ready-to-use stabilized Cas13d mRNA
Concentration: 1.0 mg/mL in 1mM sodium Citrate (pH 6.4).
mRNA length: 4407 nt. MW **MRNA27**= g/mol; **MRNA28**= g/mol; MRNA29=g/mol.

Cas13 mRNAs have been designed to produce high expression level of class 2 type VI-D CRISPR-Cas13d system derived from *Ruminococcus flavefaciens* XPD3002, a recently discovered RNA-guided RNA endonuclease. 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. Cas13d mRNA #**MRNA27** does not bear any additional nucleotide modifications while #**MRNA28** is modified with 5-methoxyuridine (5moU), and #**MRNA29** is modified with N1-methhyl-pseudouridine (N1-mψ) to reduce innate immune response.

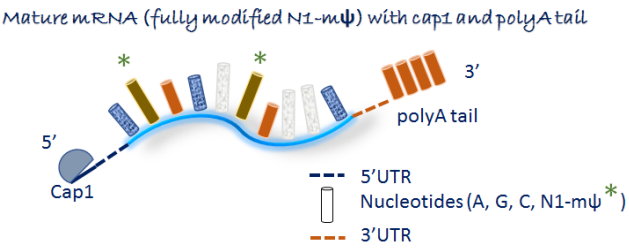
(ref# **MRNA27**):



(ref# **MRNA28**):



(ref# **MRNA29**):



Applications

The clustered regularly interspaced short palindromic repeats (CRISPR)/CRISPR-associated genes (Cas) system has been rapidly harnessed to perform various genomic engineering tasks. The known Cas13a–Cas13d effectors are able to efficiently cleave complementary target single-stranded RNAs, which represent a potentially safer alternative to deoxyribonuclease Cas9, because it induces loss-of-function phenotypes without genomic loss of the targeted gene. There are currently four subtypes identified in the Cas13 family, including Cas13a (aka C2c2), Cas13b, Cas13c, and Cas13d. All Cas13 family members are smaller than Cas9, with Cas13d being the smallest protein. The Cas13d MRNAs encode for the RNA-guided Cas13d endonuclease used to induce site-directed RNA degradation. Cas13d employs CRISPR-associated RNAs (crRNAs) that contain a customizable 22-nt spacer sequence that can direct the Cas13d protein to specific RNA molecules for targeted RNA degradation. The high catalytic activity of Cas13d in human cells provides a potential mechanism for targeting specific viral RNA genome degradation and viral gene expression inhibition (Aquino-Jarquin, 2018)(Nhan Huynh, 2020) (Timothy R. Abbott, 2020).

Cas13d 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).

Références

Aquino-Jarquin, J. T.-R. (2018). CRISPR–Cas13 Precision Transcriptome. *Cancer Research*, 78(15); 4107–13.

Nhan Huynh, N. D.-J. (2020). A versatile toolkit for CRISPR-Cas13-based. *Genome Biology*, 21:279.

Timothy R. Abbott, 1. G. (2020). Development of CRISPR as an Antiviral Strategy. *Cell*, 181, 865–876.

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Kit contents

Cas13d mRNAs-20: 20 µg of mRNA unmodified or modified.
Cas13d mRNAs-100: 100 µg of mRNA unmodified or modified.
Cas13d mRNAs-1000: 1 mg of mRNA unmodified or modified.

Storage

Cas13d mRNAs must be stored at -80°C. We recommend to aliquot the mRNA solution for a better storage.

Related Products

Ref	Description
MRNA25	Cas9 MRNA (N1-mψ)
MRNA30	Cas9 MRNA unmodified
MRNA31	Cas9 MRNA (5moU)
MRNA26	Cre MRNA (N1-mψ)
MRNA32	Cre MRNA (5moU)
MRNA33	Cre MRNA
RM21000	RmesFect™ transfection reagent 1mL
RS31000	RmesFect™ Stem transfection reagent 1mL

Discover the complete list of mRNA at: www.ozbiosiences.com
Custom mRNAs are also available now!

Contact Us

Feel free to contact us for all complementary information and remember to visit our website to stay informed on the latest breakthrough technologies and updated on our complete product list. (www.ozbiosciences.com). For bulk, please contact us: order@ozbiosciences.com

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