HA(FL)-H1N1 saRNA
(self-amplifying RNA encoding full length hemagglutinin (HA) of H1N1 subtype of Influenza A virus (A/California/04/2009(H1N1))

Description

Ready-to-use stabilized HA(FL)-H1N1 puroR saRNA
Cap Modification: Cap 1 | **Poly (A) Tail:** Yes
Concentration: 1.0 mg/mL
Buffer: 1 mM Sodium Citrate, pH 6.4
Full length mRNA: 10774 nt
Molecular weights: #**MRNA76:** 3,47 E+06 g/mol; #**MRNA77:** 3,52 E+06 g/mol

OZB saHA(FL)-H1N1 RNA has been constructed based on replicons of positive-sense ((+)-RNA) viruses (Venezuelan equine encephalitis Virus (VEEV)), where the coding sequence of the viral structural proteins is replaced with that of a gene of interest (GOI, here HA(FL)-H1N1), while retaining the coding sequences of non-structural proteins (nsPs), including the viral RNA-dependent RNA polymerase. Please note that OZB saRNAs encodes also for Puromycin Resistance Cassette, which does not alter the expression of the GOI but can be used for cell selection (Fig1).

SaHA(FL)-H1N1 RNAs have been designed to produce high expression level of HA(FL)-H1N1 protein with enhanced length of duration. OZB RNAs are produced by *in vitro* transcription. RNAs 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. RNA #**MRNA76** does not bear any additional nucleotide modifications while #**MRNA77** is modified with 5-methyl-Cytidine (m5C) (100% replacement of Cytidine).

Fig1. Structure of OZB saRNAs #**MRNA76 (unmodified nucleotides) and #MRNA77 (m5C).**

Applications

Self-amplifying RNAs (saRNAs) also called "Replicons" are the next generation of RNA vaccines. Their advantage over conventional mRNA vaccine platforms relies on the viral replication machinery, which amplifies the mRNA of the encoded gene of interest within target cells. In recent years, saRNA vaccines have been clinically tested with the hope of reducing the vaccination dose compared to the conventional mRNA approach. Replicons induce potent humoral and cellular responses with few adverse effects upon a minimal, single-dose immunization. Delivery of replicons is achieved with virus-like replicon particles (VRPs), or in nonviral vehicles such as liposomes or **lipid nanoparticles (LNPs).**

This mRNA encodes for the Hemagglutinin protein of the H1N1 flu virus. The function of hemagglutinin is to cause red blood cells to cluster together, and it attaches the virus to the infected cell. HA is a major influenza surface glycoprotein that is considered an important target to generate broad protection against influenza and is the primary target of currently developing influenza vaccines. HA protein could be used as antigen for immunization and biochemical studies.

General considerations on OZB's RNA

Synthetics mRNAs and saRNAs 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 of 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 may not lead to genetic insertion causing mutations. Moreover, the protein expression from the mRNA is promoter-independent and faster than with DNA.

For saRNA transfection reagent, please contact us. saRNA can also be encapsulated into LNPs at OZ Biosciences with our proprietary ionizable lipids upon custom request.

Quality Controls

Items	Specification	Standard QC	Superior Grade QC*
Integrity	Agarose gel mobility and fragment analyzer	✓	✓
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.

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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 saRNA 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, …).

Kit contents

saRNA HA(FL)-H1N1-20: 20 µg of saRNA.
saRNA HA(FL)-H1N1-100: 100 µg of saRNA.
saRNA HA(FL)-H1N1-1000: 1 mg of saRNA.

Related Products

Ref	Description
#MRNA70/71	saRNA GFP unmodified or 5mC
#MRNA72/73	saRNA Luc unmodified or 5mC
#MRNA74/75	saRNA Ova unmodified or 5mC

Custom mRNAs are also available now!

Bibliography

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