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## Product Data Sheet

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Product Name: Cas9 mRNA with N1-Me-pUTP (5'CAP)

Cat. No.: GM10008

### Chemical Properties

Purity	>98%	Extinction Coefficient	
Formula		M.Wt	
Salt Form		Concentration	1mg/mL
Buffer	1 mM Sodium Citrate, pH 6.4	Storage	-40°C or below
Synonyms		Backbone	
Base Analog		Sugar Type	
Nucleotide Category			

### Background

Cas9 mRNA with N1-Me-pUTP (5'CAP) is produced through in vitro transcription. By simulating the mRNA processing process in eukaryotes, it has a 5' end Cap 1 cap structure and a 3' end poly(A) tail, which increases the stability and translation efficiency of the mRNA[1]. N1-methyl-pseudouridine (1-methylpseudouridine, m1ψ) is a methyl modification of naturally occurring pseudouridine, formed by N1-specific pseudouridine A that exists in archaea and eukaryotes It is catalyzed by the base transferase NepI[2]. N1-methyl-pseudouridine is a substitute for uridine (U), which can effectively enhance RNA stability while reducing anti-RNA immune response [3].

Bacteria and archaea use the CRISPR/Cas system to defend against invading viruses and plasmids. The CRISPR/Cas system works in eukaryotic systems through two molecular components: Cas9 protein and non-coding guide RNA (gRNA). Cas9 endonuclease reaches the target site under the guidance of gRNA and cuts the sequence, resulting in gene silencing.

This product should be used in conjunction with purified Guide RNA.

References:

**Caution: Product has not been fully validated for medical applications. For research use only.**

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- [1]. Jemielity J, Fowler T, Zuberek J, et al. Novel "anti-reverse" cap analogs with superior translational properties. RNA. 2003;9(9):1108-1122.
- [2]. Callum J C Parr, et al. N 1-Methylpseudouridine substitution enhances the performance of synthetic mRNA switches in cells. 2020 Apr 6;48(6):e35. doi: 10.1093/nar/gkaa070.
- [3]. Pedro Morais, Hironori Adachi, Yi-Tao Yu. The Critical Contribution of Pseudouridine to mRNA COVID-19 Vaccines. 2021 Nov 4;9:789427. doi: 10.3389/fcell.2021.789427.

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