

Product Data Sheet

Product Name: m7G(5')ppp(5')(2'OMeA)pG

Cat. No.: GN20149

Chemical Properties

Purity	>99.50%	Extinction Coefficient	30,539 Lmol ⁻¹ cm ⁻¹ at 255 nm
Formula	C ₃₂ H ₄₃ N ₁₅ O ₂₄ P ₄ (free acid)	M.Wt	1145.60 g/mole (free acid)
Salt Form	NH ₄ ⁺	Concentration	101 mM
Buffer	H ₂ O	Storage	-20°C or below
Synonyms	m7GpppAmpG	Backbone	5'-5'-Triphosphate
Base Analog	Adenosine, Guanosine	Sugar Type	
Nucleotide Category	Cap analogs		
Applications	CRISPR, In vitro Transcription, Recombinases, TALENS, Transposases, Vaccine Development, Zinc Finger Nucleases		

Protocol

In vitro transcription of mRNA (IVT; 20μL system) [1]:

This plan is based on literature, please modify it to meet your specific needs.

Buffer: 40mM Tris-HCl, pH=7.9; 10mM MgCl₂; 1mM DTT; 2mM spermidine

Template: 50ng/μL linearized plasmid

1. Add 10U/μL T7 RNA polymerase; 1U/μL RNase inhibitor; 2mM ATP/CTP/UTP; 0.5mM GTP and 3mM m7G(5')ppp(5')(2'OMeA)pG to the buffer and incubate at 37°C for 2 hours.

Note: Adding m7G(5')ppp(5')(2'OMeA)pG to GTP at a 6:1 ratio improves capping efficiency.

2. Add 1U/μL DNase I and continue incubation at 37°C for 30 minutes.

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

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3. Crude mRNA was purified using NucleoSpin RNA Clean-up XS; uncapped mRNA was removed using 5'-polyphosphatase and Xrn1.

4. RP-HPLC removal of dsRNA impurities: A linear gradient of buffer B (0.1M triethylamine acetate, pH=7.0, containing 25% acetonitrile) in buffer A (0.1M triethylamine acetate, pH=7.0) was applied from 5% to 50% for 18min at a flow rate of 0.9mL/min. mRNA was recovered from the collected fraction by isopropanol precipitation.

References:

[1] Sikorski PJ, Warminski M, Kubacka D, et al. The identity and methylation status of the first transcribed nucleotide in eukaryotic mRNA 5' cap modulates protein expression in living cells. Nucleic Acids Res. 2020;48(4):1607-1626.

Background

m7G(5')ppp(5')(2'OMeA)pG is an mRNA 5'cap analog belonging to the Cap 1 class with a 2'-O-methyl modification. m7G(5')ppp(5')(2'OMeA)pG is used in in vitro transcription (IVT) systems to generate capped mRNA, thereby enhancing mRNA stability and translation efficiency.

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