N1-Methylpseudouridine

Cat. No.: HY-112582

CAS No.: 13860-38-3

Molecular Formula: $C_{10}H_{14}N_2O_6$

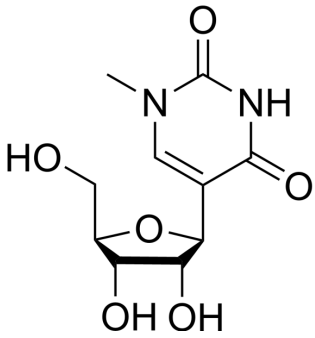
Molecular Weight: 258.23

Target: Nucleoside Antimetabolite/Analog; DNA/RNA Synthesis

Pathway: Cell Cycle/DNA Damage

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	2 years
	-20°C	1 year



SOLVENT & SOLUBILITY

In Vitro

DMSO : 125 mg/mL (484.06 mM; Need ultrasonic)

H_2O : 50 mg/mL (193.63 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	3.8725 mL	19.3626 mL	38.7252 mL
	5 mM	0.7745 mL	3.8725 mL	7.7450 mL
	10 mM	0.3873 mL	1.9363 mL	3.8725 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 50 mg/mL (193.63 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.08 mg/mL (8.05 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (8.05 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (8.05 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

N1-methyl-pseudouridine (1-Methylpseudouridine), a methylpseudouridine, outperforms 5 mC and 5 mC/N1-methyl-pseudouridine in translation. N1-methyl-pseudouridine in mRNA enhances translation through eIF2α-dependent and independent mechanisms by increasing ribosome density[1].

In Vitro	Incorporation of N1-methyl-pseudouridine into mRNA modifies mRNAs produced higher amounts of luc than the standard Luc mRNA in HEK293T cells. Incorporation of N1-methyl-pseudouridine nucleoside modification in both Luc and GFP mRNA enhances the initiation step of translation, in part by suppressing eIF2α phosphorylation. In addition, polysome formation and growth on the NN1-methyl-pseudouridine-containing Luc mRNA is enhanced due to the reduction of elongation rate. In all the in vitro translation systems, incorporation of N1-methyl-pseudouridine in Luc and GFP mRNAs dramatically enhanced translation. The N1-methyl-pseudouridine-Luc mRNA is associated with heavier polysomes than Luc mRNA[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	N1-methylpseudouridine-incorporated mRNA outperforms pseudouridine-incorporated mRNA by providing enhanced protein expression and reduced immunogenicity in mammalian cell lines and mice[2]. N1-methyl-pseudouridine (1-Methylpseudouridine) (20 μg; I.m. or i.d. routes for 21 days) and m5C/ N1-methyl-pseudouridine-modified mRNA respectively have a higher translational capacity than Ψ and m5C/Ψ-modified mRNA in vivo [2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	7-week-old Balb/c mice[1]
Dosage:	20 μg
Administration:	I.m. or i.d. routes for 21 days
Result:	had a higher translational capacity.

REFERENCES

[1]. Nance KD, Meier JL. Modifications in an Emergency: The Role of N1-Methylpseudouridine in COVID-19 Vaccines. ACS Cent Sci. 2021;7(5):748-756.

[2]. Svitkin YV, et al. N1-methyl-pseudouridine in mRNA enhances translation through eIF2α-dependent and independent mechanisms by increasing ribosome density. Nucleic Acids Res. 2017 Jun 2;45(10):6023-6036.

[3]. Andries O, et al. N(1)-methylpseudouridine-incorporated mRNA outperforms pseudouridine-incorporated mRNA by providing enhanced protein expression and reduced immunogenicity in mammalian cell lines and mice. J Control Release. 2015 Nov 10;217:337-44.

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