Product Data Sheet

Product Name: Fluc mRNA with N1-Me-pUTP (5’CAP)
Cat. No.: GM10005

Chemical Properties

Purity		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

Luciferase(Fluc) can detect gene expression extremely sensitively and efficiently, so it is often used as a bioluminescent reporter gene for gene regulation and functional studies. Fluc mRNA can express proteins directly in the cytoplasm without relying on a promoter. The protein expression speed is faster than transfected DNA. The protein expression level is directly related to the transfection amount of mRNA, and there is no risk of gene integration. Firefly luciferase protein catalyzes intracellular luciferin or fatty aldehyde to produce autofluorescence, producing chemiluminescence at a wavelength of about 550-570nm[1].

Luciferase can be used to detect promoter activity or dual fluorescent molecule complementation experiments. Firefly luciferase and Renilla luciferase can respectively catalyze their respective substrates to emit fluorescence of different colors. The two light absorption wavelengths are different and the detection does not interfere with each other. Therefore, they can be used as dual luciferases in the same chemical reaction system. Reporter gene systems are used simultaneously[2].

By simulating the mRNA processing process in eukaryotes, the product has a Cap 1 cap

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structure at the 5' end and a poly(A) tail at the 3' end, which increases the stability and translation efficiency of the mRNA[3]. N1-Me-pUTP is a methyl modification of the naturally occurring pseudouridine pUTP, which is catalyzed by the N1-specific pseudouridine methyltransferase Nepl that exists in archaea and eukaryotes[4]. This product uses N1-Me-pUTP instead of UTP, which effectively enhances RNA stability and reduces anti-RNA immune responses[5].

References:

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[3]. 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.
[4]. 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.
[5]. 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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