Data Sheet (Cat.No.TMRH-0018)

TargetMol

eGFP(cy5) mRNA

Chemical Properties

CAS No. :

Formula:

Molecular Weight:

Storage: Store at low temperature
Store at -80°C
Actual storage temperature shall be subject to the COA.

Biological Description

Description	eGFP(cy5) mRNA is a chemically modified synthetic mRNA designed for high-sensitivity tracking of gene delivery processes. The compound features a dual-functional design: its nucleotide sequence encodes the enhanced Green Fluorescent Protein (eGFP) to quantify translation efficiency, while the mRNA backbone is covalently labeled with the near-infrared fluorophore Cy5. This dual-labeling system enables researchers to distinguish the physical distribution of mRNA (uptake/endocytosis, visualized as Cy5 red signal) from its functional biological activity (protein expression, visualized as eGFP green signal) at the single-cell level. It is widely utilized in lipid nanoparticle (LNP) formulation optimization, endocytic pathway elucidation, and tissue distribution studies.
Targets(IC50)	Others
In vitro	In cancer cell models (e.g., A549, HepG2), eGFP(cy5) mRNA delivered via LNPs allowed for the profiling of endocytic escape; flow cytometry and confocal microscopy revealed that while over 90% of cells were Cy5-positive (indicating successful uptake), only a fraction showed eGFP expression, highlighting the "lost in translation" phenomenon during intracellular trafficking [1][3].
In vivo	In mouse models of lung fibrosis and liver distribution, systemic or local administration of LNP-encapsulated eGFP(cy5) mRNA demonstrated robust accumulation in liver macrophages and lung tissues; Cy5 signals confirmed organ-specific localization, while eGFP fluorescence quantified the extent of functional protein synthesis in different cell types [1][2].

Reference

Lin, C., et al., (2025). Exceptional Uptake, Limited Protein Expression: Liver Macrophages Lost in Translation of Synthetic mRNA. Advanced science (Weinheim, Baden-Wurttemberg, Germany), 12(9), e2409729.
Massaro, M., et al., (2023). Lipid nanoparticle-mediated mRNA delivery in lung fibrosis. European journal of pharmaceutical sciences: official journal of the European Federation for Pharmaceutical Sciences, 183, 106370.
Sayers, E. J., et al., (2019). Endocytic Profiling of Cancer Cell Models Reveals Critical Factors Influencing LNP-Mediated mRNA Delivery and Protein Expression. Molecular therapy : the journal of the American Society of Gene Therapy, 27(11),

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