Lipid Nanoparticles Formulation Services

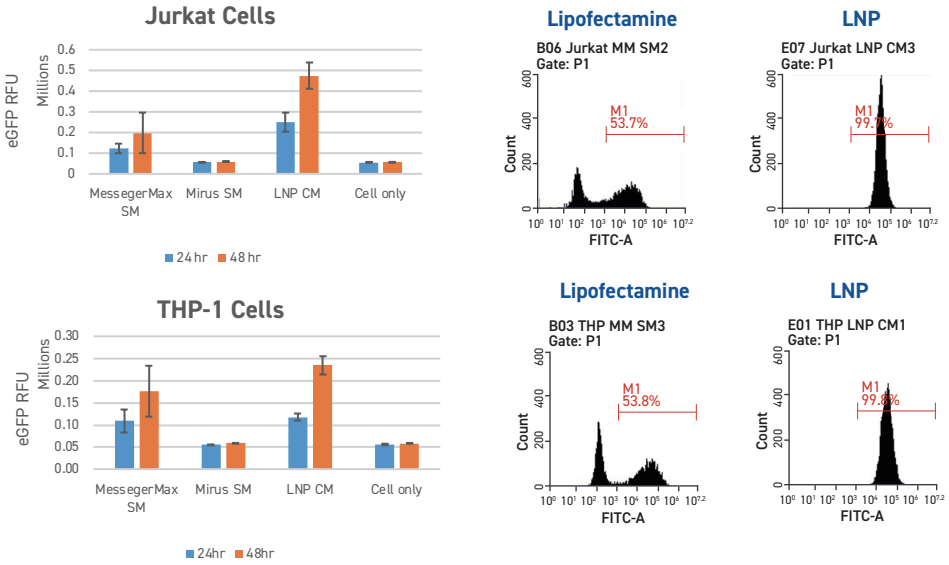
GenScript streamlined the production workflow for mRNA from gene synthesis to delivery. GenScript's mRNA solution will not only facilitate the mRNA research field by saving time and cost but it can also reduce the potential logistical risks involved in each production step.

GenScript developed its Lipid Nanoparticles (LNP) service with multiple formulation options, providing delivery solutions for mRNA screening projects with high efficiency and safety.

High Transfection Efficiency Observed in Immunce Cells with SM102 Formulation <*in vitro*>

GenScript's SM-102 based LNP formulation showed high transfection efficiency of eGFP mRNA compared to other transfection agents in immune cells. The transfection efficiency of SM-102 LNP formulation in Jurkat and THP1 cells was close to 100% as shown below, compared to about 54% transfection efficiency using lipofectaimeMessengerMax.

LNP has higher transfection efficiency in immune Cells



Transfection efficiencies of GenScript LNP-SM102, lipofectamine MessengerMax, or Mirus TransIT-Jurkat Transfection Reagent were compared for delivering eGFP mRNA into Jurkat Cells and THP-1 Cells.

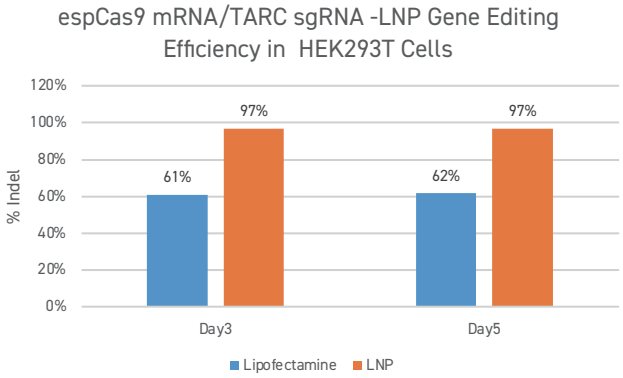
100 ng or 200 ng of mRNA were added into each well of a 24-well plate to transfect cultured Jurkat or THP-1 cells. Starvation medium (OptiMEM) was used for transfection with lipofectamine and TransIT, per manufacture's instruction, and complete medium was used for LNP. The expression of eGFP was measured by flow cytometry after 48 hours.

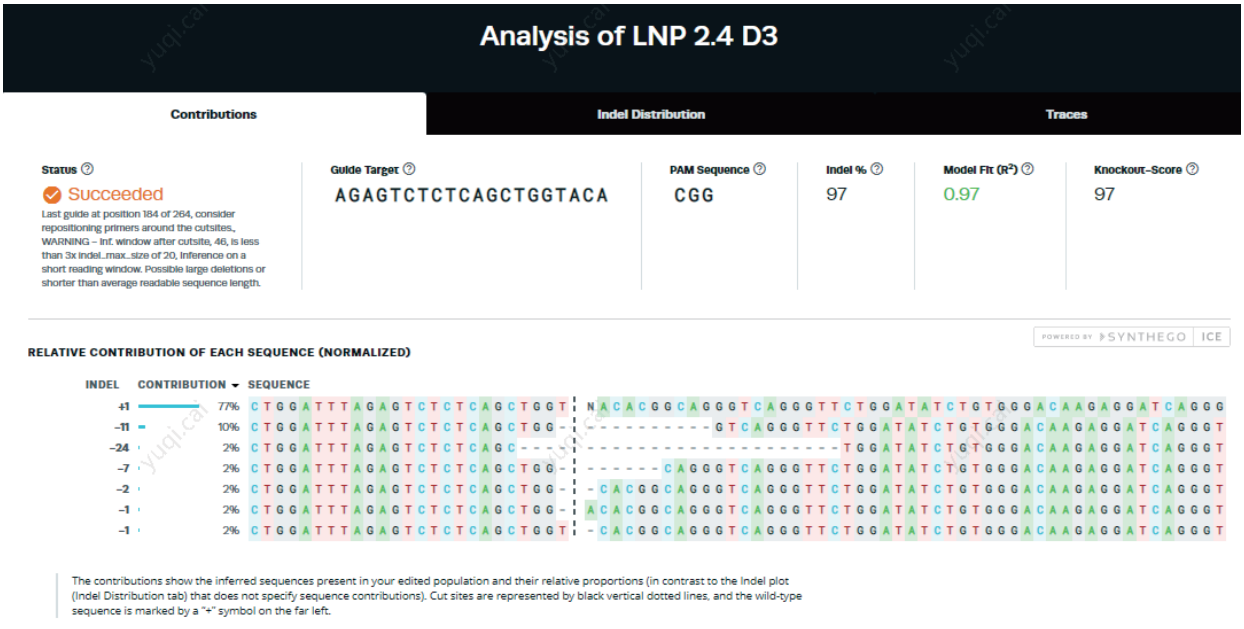
GenScript
Make Research Easy

Effective delivery of Cas9 mRNA/ sgRNA to HEK293T Cells <*in vitro*>

EspCas9 mRNA/sgRNA targeting TARC (GenScript) were delivered in a LP01-LNP formulation at 1:1 mass ratio achieving 97% editing efficiency, compared to 61% with lipofectamine.

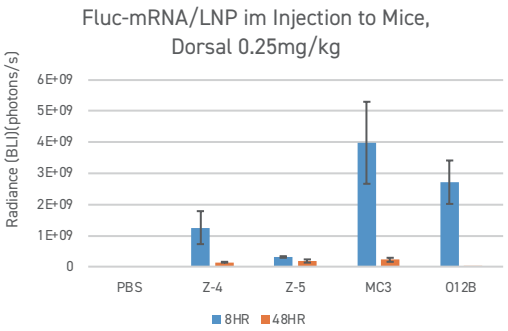
2.4 ug of RNA/LNP formulation were incubated with HEK293T cells. Cell were lysed at days 3 and 5 for PCR and Sanger sequencing. Gene editing efficiency data were obtained with the ICE Analysis Tool and GenScript data analysis software.

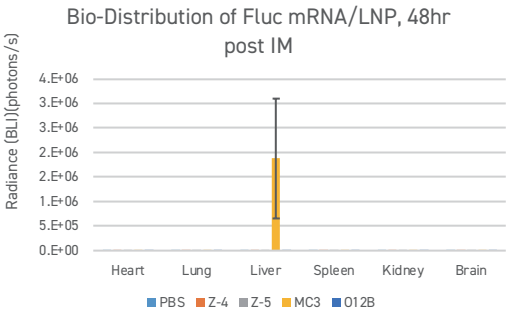


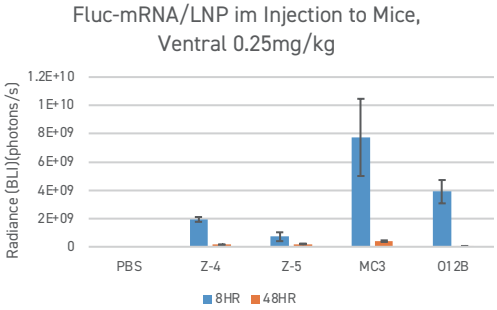


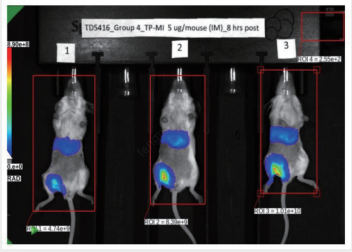
Strong mRNA Expression Observed in Mouse models with MC3 Formulation <*IM injection*>

Fluc-mRNA delivered by MC3-LNP showed the highest expression level after 8 and 48 hours as shown below from both the Dorsal and Ventral whole-body view. MC3-LNP showed the strongest liver accumulation compared to other formulations after 48 hours.









GS-MC3 LNP formulation has strong mRNA expression

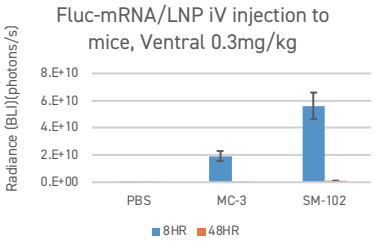
GS-MC3 LNP as generic formulation for customers' mRNA screening project

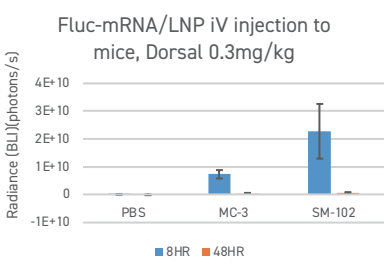
Delivery efficiency of Fluc mRNA (100% N1-methyl-pseU modified, GenScript) by four LNP formulations administered to Balb-C mice through IM injection at the dose of 0.25mg/kg. Fluc mRNA expression was assessed through whole-mouse imaging of both the Dorsal and Ventral body aspects after 8 and 48 hours (Left panels).

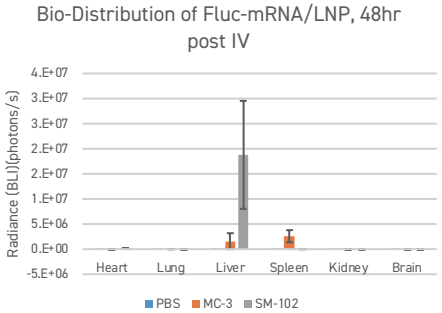
The expression of Fluc mRNA was measured by whole-body bioluminescence imaging (Bottom right). Bio distribution profile of different formulations was assessed in the heart, liver, lung, spleen, kidney and brain (Top right).

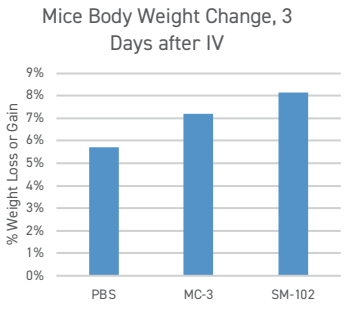
Strong mRNA Expression Observed in Mouse models with MC3 Formulation <*IV Injection*>

Fluc-mRNA delivered with SM-102 LNP showed higher expression efficiency than the MC-3 LNP formulation after 8 and 48 hours post IV injection by whole-body imaging of both Dorsal and Ventral body aspects. In addition, SM-102 LNPhad showed stronger liver accumulation compared to MC-3 LNP after 48 hours.









Both LNP formulations are safe for IV injection

SM102 has stronger liver accumulation among the four tested formulations

MC-3 and SM-102 LNP formulations were used to deliver Fluc mRNA (100% N1-methyl-pseU modified, GenScript) to Balb-C mice through IV injection at a dose of 0.3mg/kg. The expression of Fluc mRNA was measured by whole-body bioluminescence imaging (Left panels). To evaluate the bio distribution profile of different formulations, heart, liver, lung, spleen, kidney and brain of the mice were collected and imaged after 48 hours (Top Middle). Both formulations resulted in minimal body weight loss, evaluated 3 days after injection (Top right).