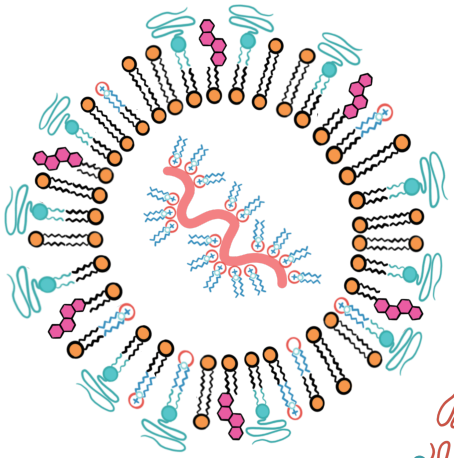
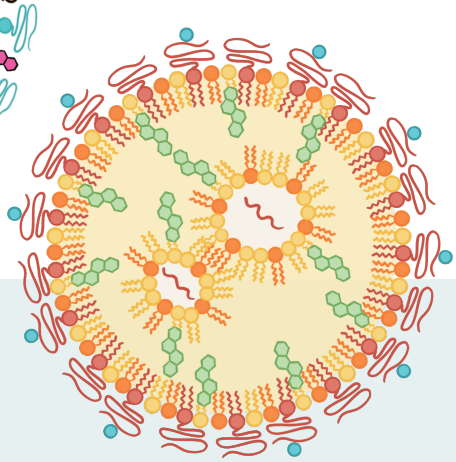
VectorBuilder

mRNA Gene Delivery Solutions

mRNA possesses unique merits compared to other biologics and is a promising candidate for development and use as a drug. VectorBuilder provides a one-stop solution for the development of mRNA-based therapeutics such as vaccines, gene editing, chimeric antigen receptor, and protein expression in cells or embryos. Based on extensive design and production experience, our team can support researchers from in vitro transcription vector design and codon optimization, all the way to manufacturing of mRNA and LNPs for in vivo use.

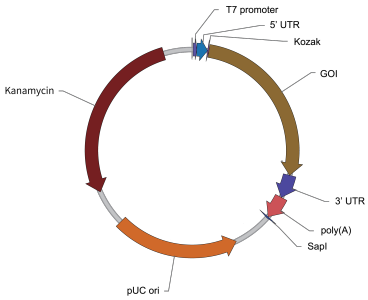




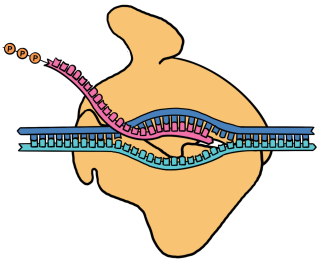
Highlights

- Custom IVT vector cloning with rapid turnaround.
- Variety of in-house validated 5' & 3' UTRs and polyA tails available for sourcing.
- T7 RNA polymerase-based synthesis for conventional and self-amplifying mRNA of up to 10,000 nt from ug to hundreds of mg scale.
- Modified nucleotides m1Ψ and m5C can be incorporated during synthesis to enhance mRNA translation and immune evasion.
- High-quality mRNA-LNP encapsulation at mg scale.
- Comprehensive quality controls and LNP profiling.
- We offer clinically oriented CRO services to assess mRNA-LNP gene delivery efficacy and safety using animal models including rodents and NHPs.

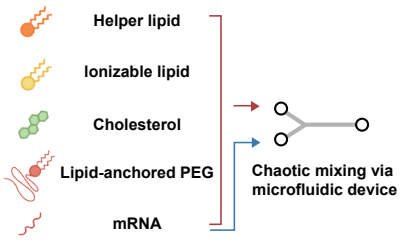
Our Capabilities



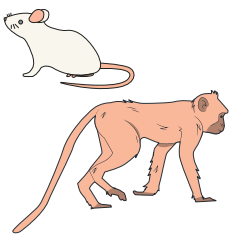
Custom In Vitro Transcription Vector Design



High Yield In Vitro Transcription and Capping



LNP Encapsulation Services



In Vivo Expression Testing

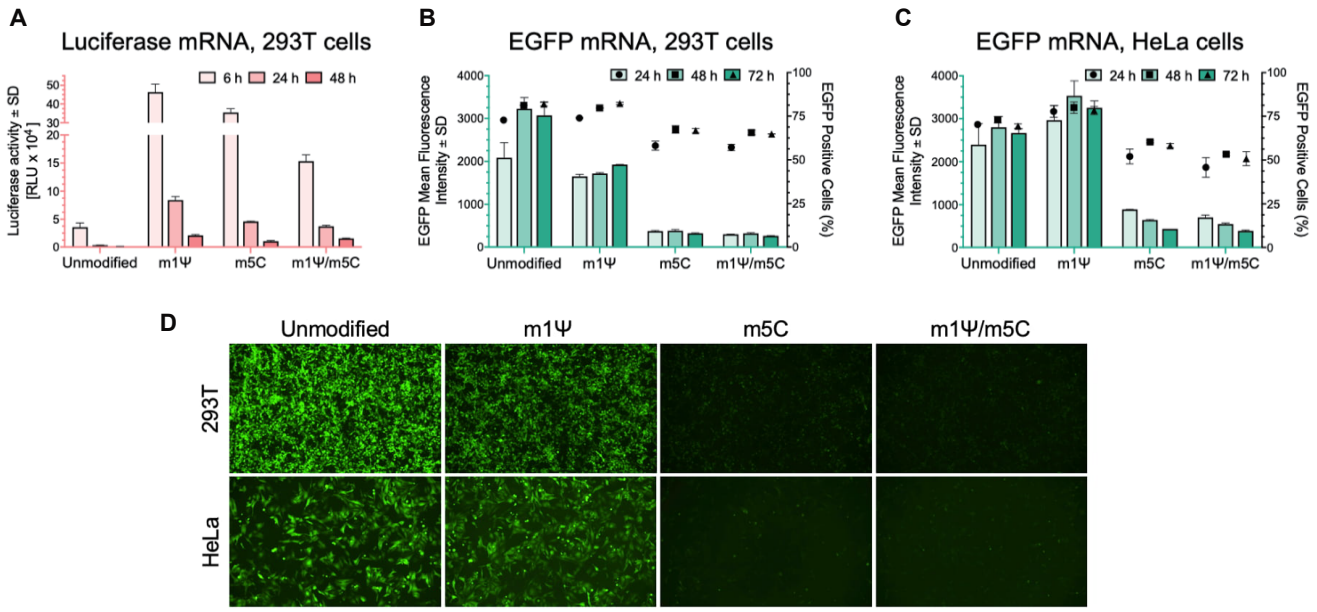


Figure 1. Expression of luciferase and EGFP mRNA in 293T or HeLa cells. The mRNA was generated with or without modified nucleotides m1Ψ and m5C. Cells were transfected with 1 ug of mRNA. (A) Luciferase activities in 293T cells at 6 h, 24 h, and 48 h post-transfection. Error bars indicate standard deviations. EGFP expression in 293T cells (B) and HeLa cells (C) at 24 h, 48 h, and 72 h post-transfection quantified by flow cytometry. Mean fluorescence intensities are represented by colored bars and percentages of EGFP positive cells are represented by circles, squares, and triangles. Error bars indicate standard deviations. (D) EGFP expression in 293T cells and HeLa cells at 72 h post-transfection observed by microscopy (100X).

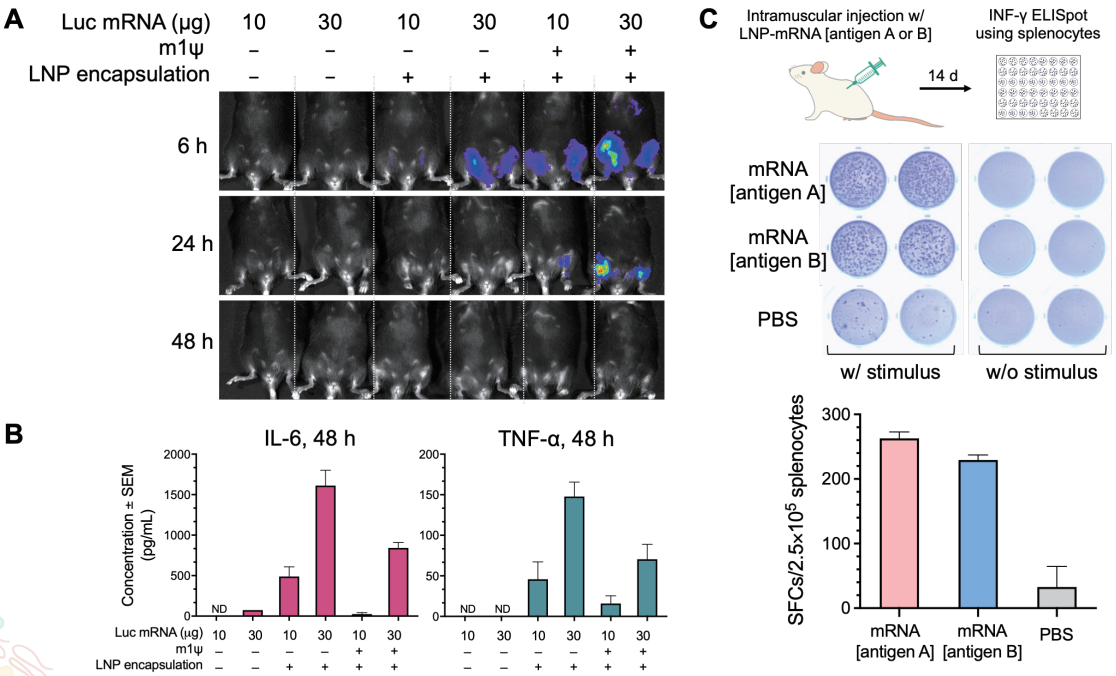


Figure 2. Expression of luciferase (Luc) mRNA and mRNA induced immune response in mice. (A) Luciferase activity visualized by live imaging at 6 h, 24 h, and 48 h post-injection. (B) Two pro-inflammatory cytokines, IL-6 and TNF-α, were quantified in the serum at 48 h post-injection. Error bars represent standard errors. Mice strain: C57BL/6J; mice age: 8 weeks; injection method: intramuscular injection. (C) IFN-γ ELISpot assay of splenocytes derived from Balb/C mice 14 days post intramuscular injection of 30ug LNP-encapsulated mRNA coding for viral antigen A, viral antigen B, or control PBS.