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(54) Title: IMPROVED PROCESS OF PREPARING MRNA-LOADED LIPID NANOPARTICLES

(57) Abstract: The present invention provides an improved process for lipid nanoparticle formulation and mRNA encapsulation. In some embodiments, the present invention provides a process of encapsulating messenger RNA (mRNA) in lipid nanoparticles comprising a step of mixing an mRNA solution containing low citrate concentration and a lipid solution at an ambient temperature. Thus, the present invention provides an effective, reliable, energy- saving and cost-effective method of encapsulating mRNA into lipid nanoparticles.

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