

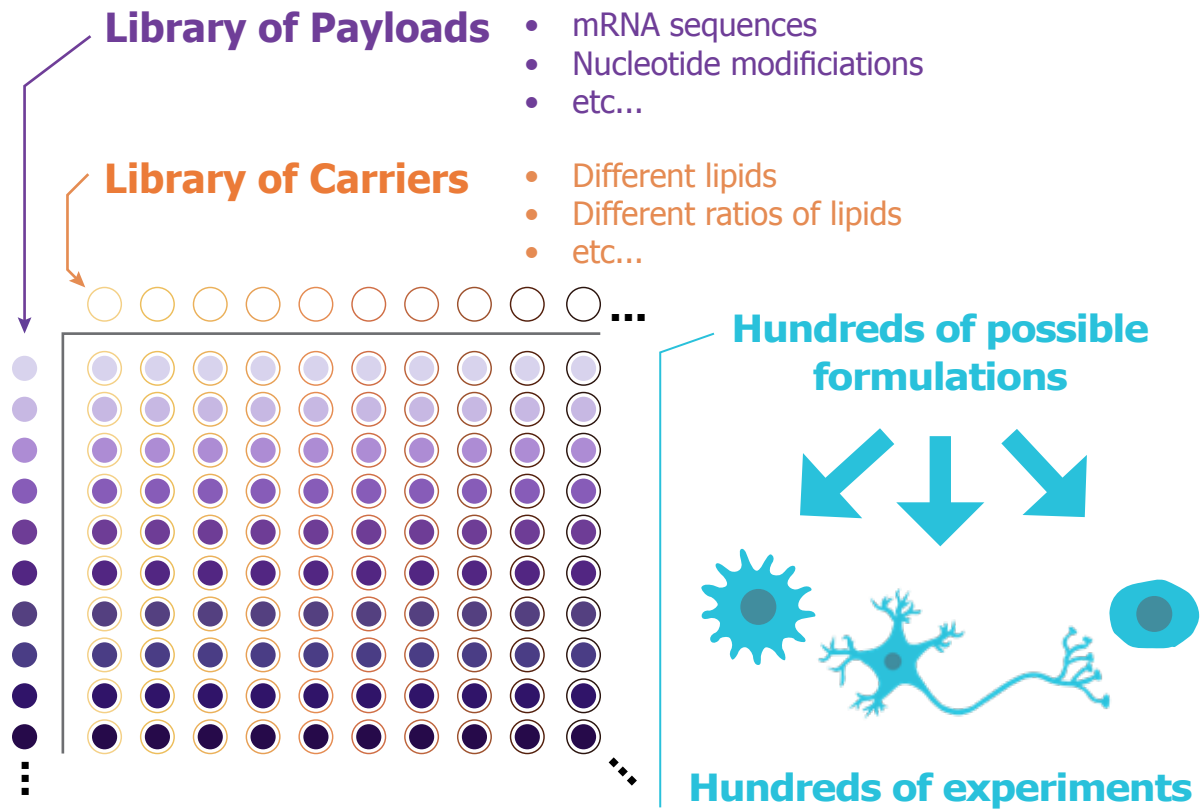
NanoAssemblr[®] Spark[™]

Freedom to Discover

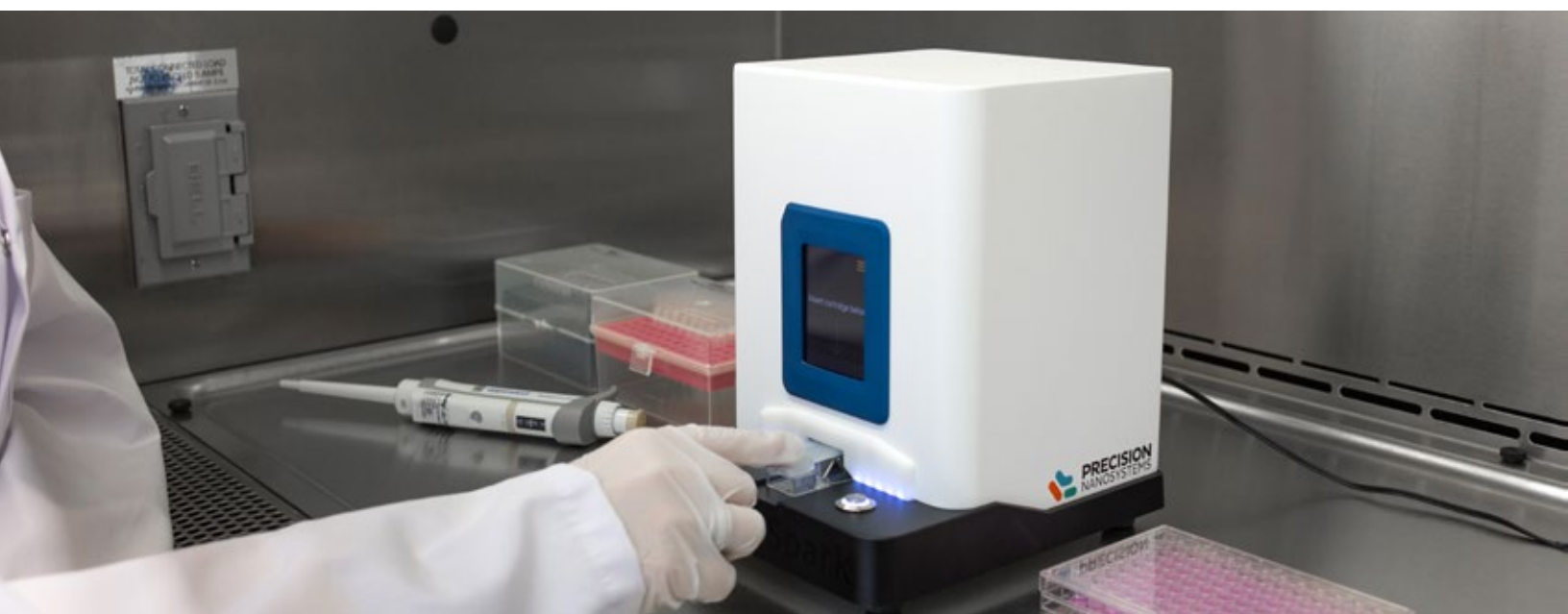


Explore Novel Nanomedicine Formulations

Rapid, reliable, small-scale formulations are needed to streamline discovery of revolutionary new medicines.



These materials can be costly or in short supply. rapid, reliable, small-scale formulations are needed.



Accelerate Nanomedicine Development

The NanoAssemblr Spark is ideal for nanomedicine formulation screening at microliter scales



Spark is ideal for screening formulations because it provides:



MINIMAL SAMPLE CONSUMPTION

Advanced microfluidics allows microliter formulation volumes appropriate for *in vitro* screening.



INTUITIVE OPERATION

Simply pipette starting materials into wells, push a button, and pipette out completed formulations.



RAPID PRODUCTION

A single formulation in under 10 seconds. Make hundreds of Spark formulations in hours instead of days.



ROBUST PROCESS

Electronic control minimizes batch-to-batch and user variability.



WORKFLOW INTEGRATION

The Spark system is designed for operation in a sterile biosafety hood. Formulate on-demand and apply directly to cells in culture.



SCALABLE

Microfluidic mixing technology allows formulations to be scaled across the NanoAssemblr Platform to accelerate future development.

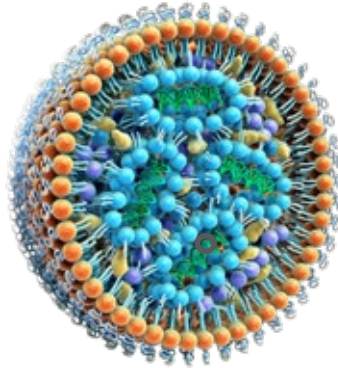
Powerful Screening Capabilities

Spotlight: Lipid Nanoparticles (LNPs)





LNPs are the most clinically advanced RNA delivery technology

Inside an LNP



Ionizable cationic lipids contribute to excellent encapsulation and payload release. Excipients, payloads and their relative quantities affect potency.



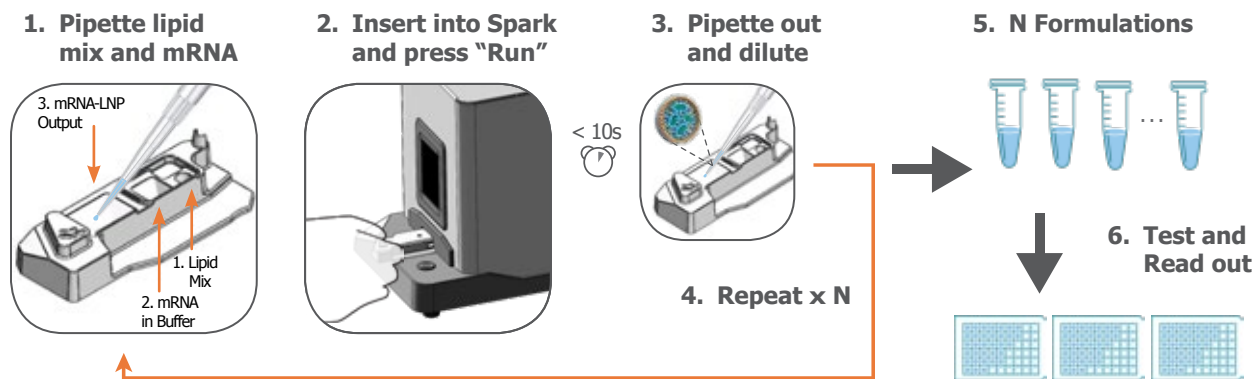
Excipients

-  Ionizable Cationic Lipid
-  Cholesterol
-  Helper Lipid
-  PEG-lipid

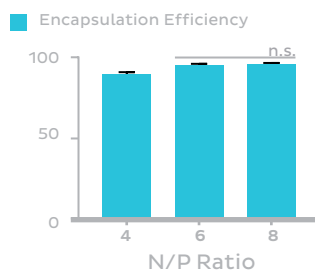
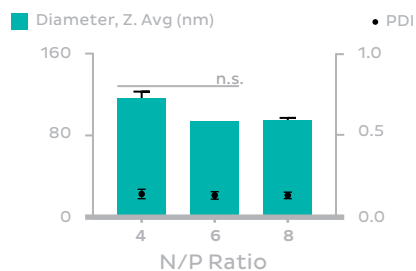
Payload

-  siRNA
-  mRNA
-  Plasmid

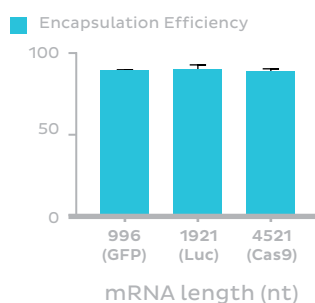
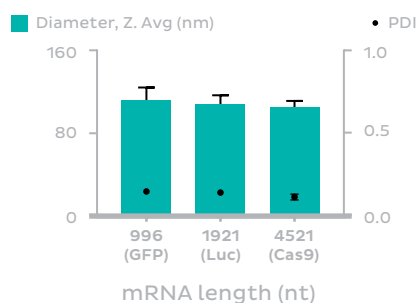
Screen LNP formulations efficiently with Spark



Formulate LNPs in seconds using less than 25 µg of mRNA and 1 mg of ionizable lipid



N/P ratio is a key factor in performance. Here, mRNA LNPs were rapidly made at 3 N/P ratios with Spark



LNPs encapsulating 3 different mRNAs were made with different mRNA lengths on the Spark with no change in size.

Case Study

Screening mRNA LNPs in human neurons for neurotherapeutic applications

Background

Therapeutic paradigm: Development of a gene-based therapy for neurodegenerative disease applications.

Formulation: mRNA encoding a green fluorescent protein (GFP) reporter gene encapsulated in an ionizable, cationic-lipid based nanoparticle.

Challenge

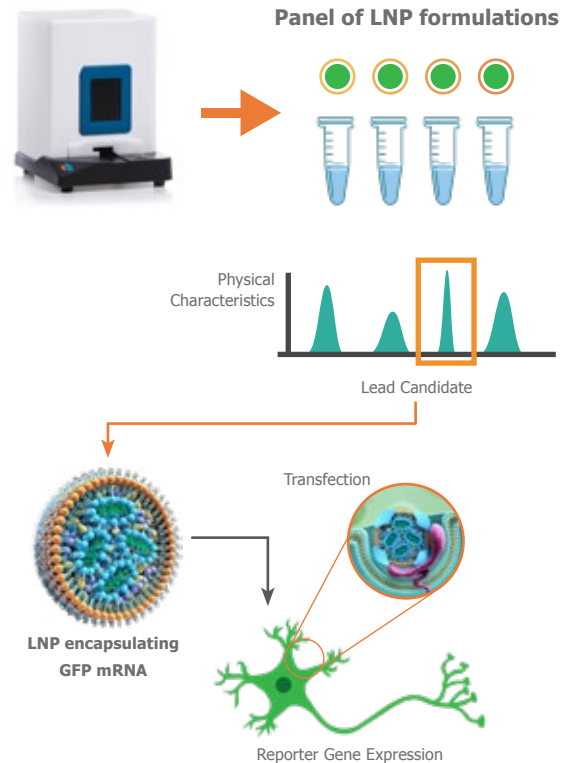
Human neurons are sensitive, difficult-to-transfect cells and are highly susceptible to harsh gene delivery methods. Small LNP formulation volumes under consistent conditions are ideal for screening novel lipid excipients tailored towards safe and effective neuronal gene delivery.

Methodology

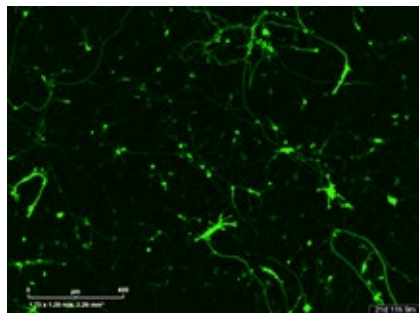
A panel of LNP formulations was quickly and easily formulated on the NanoAssemblr Spark. Lead candidate formulations were selected based on particle characteristics, the intensity of gene expression and preservation of iPSC-neuron viability.

Outcomes

The Spark enabled an accelerated screening work flow to identify mRNA LNP formulations optimal for gene delivery to neurons.



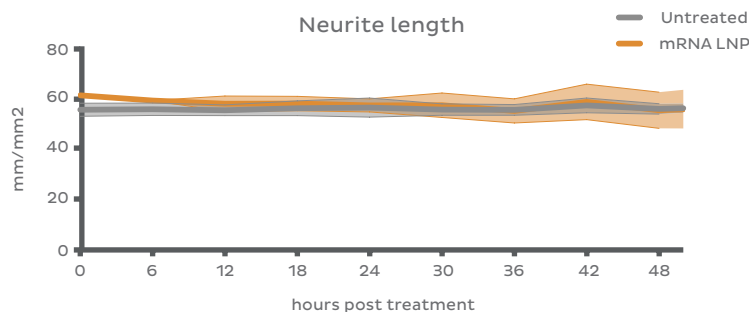
Efficient gene delivery, robust gene expression



Human iPSC-neurons strongly express the GFP mRNA delivered using mRNA LNPs formulated on the Spark.

Safe solutions for sensitive cells

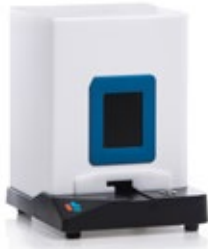

Lead mRNA LNP formulations minimally impact neuron health and viability.



The NanoAssemblr Spark accelerates screening workflows for the identification of novel LNPs for biological applications. Lead candidates were rapidly identified as effective nucleic acid delivery systems while preserving the viability of human neurons.

See the full story online:
precisionnanosystems.com/spark-case-study

Ordering Information

	NAME	PRODUCT CODE	INCLUDES
	NanoAssemblr Spark Instrument Package	NIS0003	1 NanoAssemblr Spark Instrument 5x 20-pack Spark Cartridge 1 On-site installation and training 1 1 Year Warranty
	Spark Cartridge - 20 pack	NIS0009	20 Spark Cartridges

To learn more about the NanoAssemblr Benchtop, see a demo video, or request a quote, visit precisionnanosystems.com/our-technology/spark

Or to learn more about the NanoAssemblr Platform, visit precisionnanosystems.com/our-technology/what-is-nanomedicine

About Precision NanoSystems

Precision NanoSystems Inc. (PNI) creates innovative solutions for the discovery, development and manufacture of novel nanoparticles for use as medicines and in medical research. PNI's proprietary NanoAssemblr Platform enables the rapid, reproducible, and scalable manufacture of next generation nanoparticle formulations for the targeted delivery of therapeutic and diagnostic agents to cells and tissues in the body. PNI provides instruments, reagents and services to life sciences researchers, including pharmaceutical companies, and builds strategic collaborations to revolutionize healthcare through nanotechnology.

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