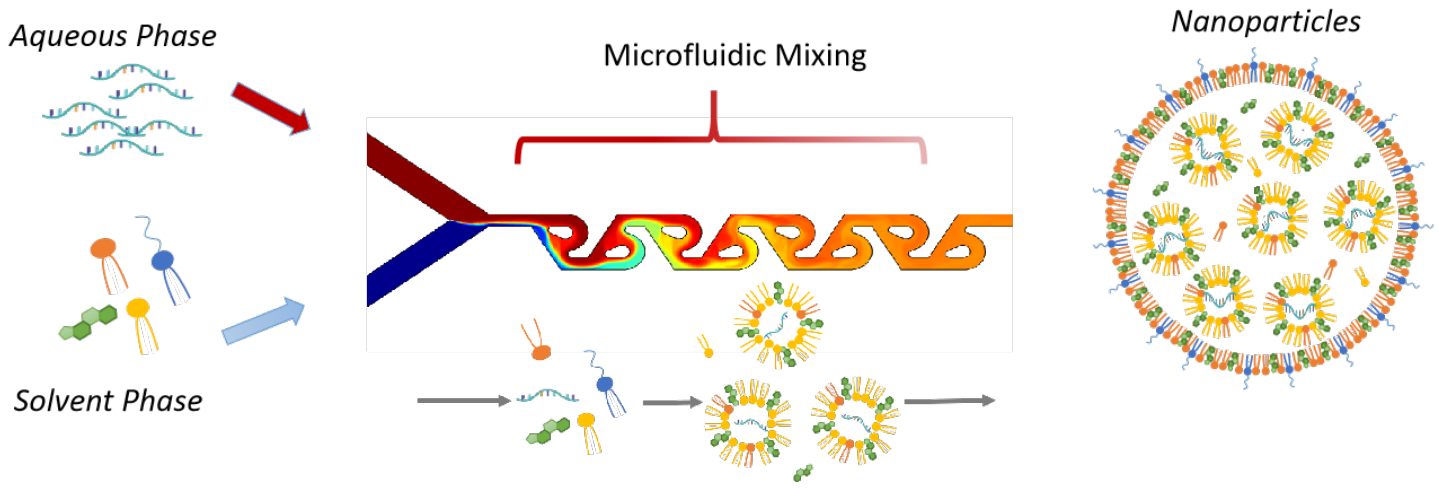
NanoGenerator® Nanoparticle Synthesis System and LipidFlex™ Formulation

PreciGenome

AUG 2025

What are Lipid Nanoparticles?

Lipid nanoparticles (LNPs) are self-assembling structures of natural or synthetic lipids in aqueous environment.

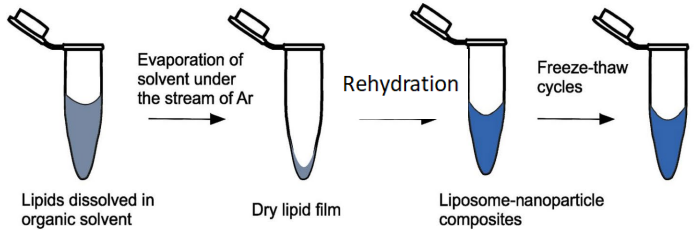


- Cationic/ionizable lipid
- Structural lipid
- Cholesterol
- PEGylated lipid
- Nucleic acid payload

Lipid Nanoparticle Synthesis Methods

Conventional Methods

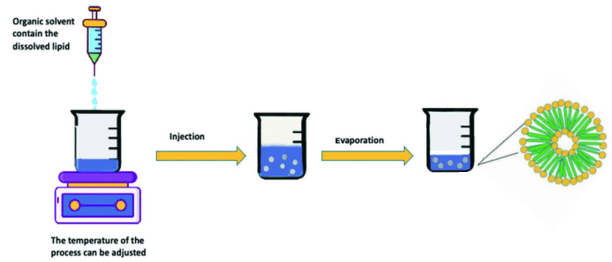
A Film hydration



- Established method
- Understood method

- High consumption of organic solvent
- High PDI
- Lack of reproducibility
- Need for additional downsizing step
- Difficulties in scaling-up

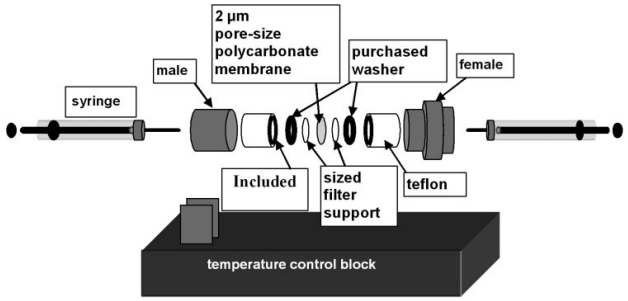
B Solvent injection



- Simple and fast
- Scaling-up possible

- Exposure to organic solvent
- High PDI
- Stability problem

C Extrusion



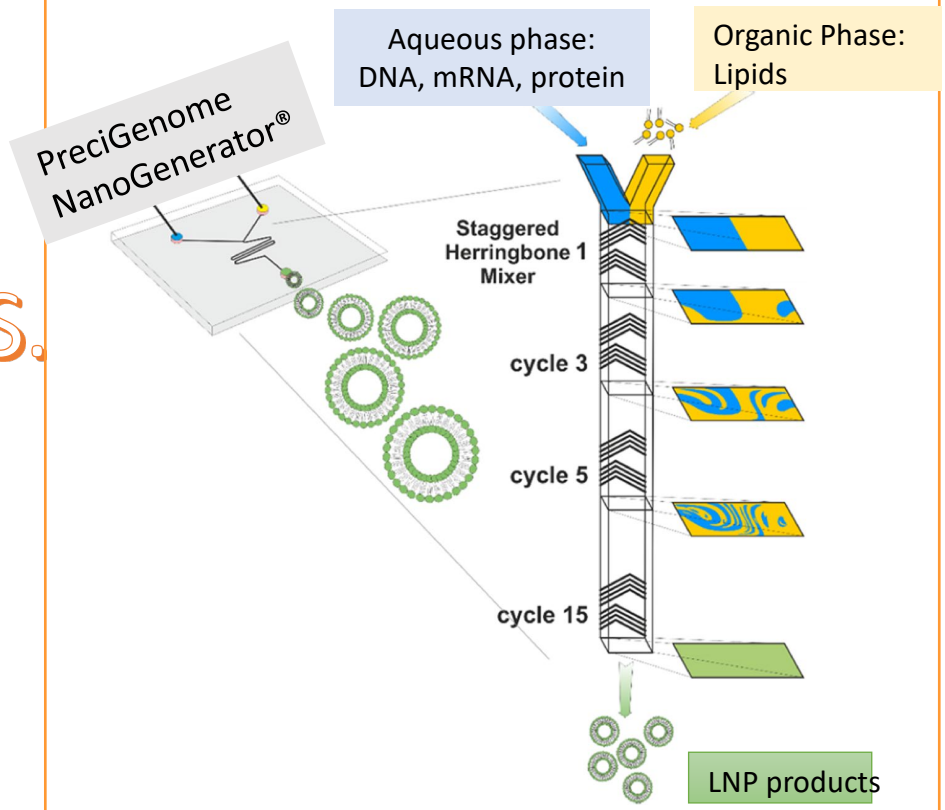
- Uniform and homogenous formulation

- Possible clogging of membrane pores
- Difficulties in scaling up

Nanomaterials, Volume 11, 2021, 3440

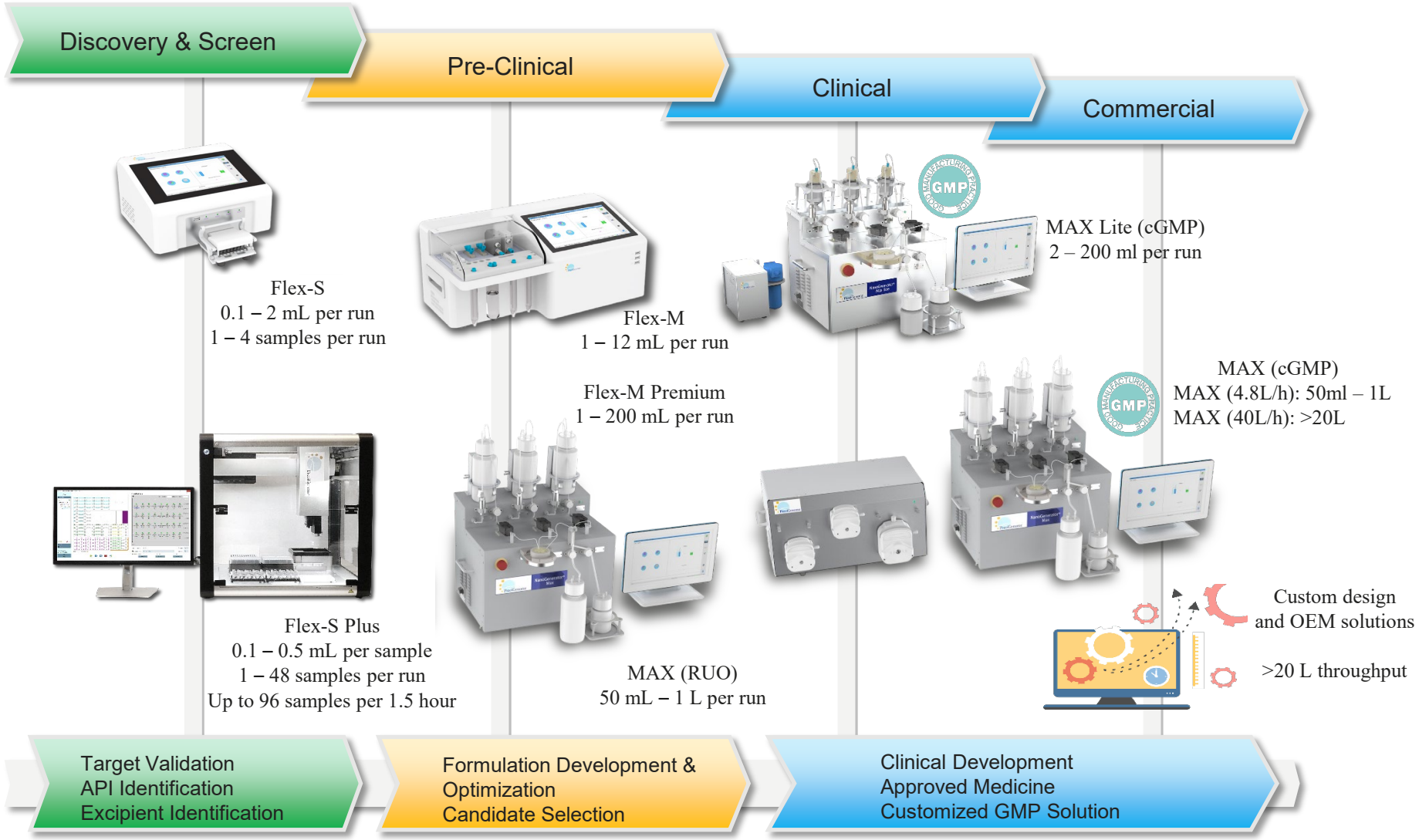
VS.

Microfluidic Mixer



Reference: Scientific Reports volume 10, Article number: 5595 (2020)

NanoGenerator® - Nanoparticle Synthesis System



NanoGenerator® - Nanoparticle Synthesis System

Basic Features




	Flex-S	Flex-S Plus	Flex-M	Flex-M premium	MAX Lite	MAX (4.8L/h)	MAX (40L/h)
Product Model	PG-SYN-FS	PG-SYN-SP	PG-SYN-FM	PG-SYN-FM	PG-SYN-GL	PG-SYN-G	PG-SYN-G
R&D Stage	Screening & Discovery (Characterization, in *vitro* & in *vivo*)		Screening & Discovery (in *vivo*)	Discovery & Preclinical Studies	Preclinical & Clinical Studies	Preclinical & Clinical Studies	Clinical Studies & Production
cGMP Version	No				YES		
Throughput	0.1 – 2 ml	0.1 – 0.5 ml	1 – 12 ml	1 – 200 ml	2 – 200 ml	50 ml – 1 L	> 20 L
Multiple Samples per Run	1 – 4	(1 – 4) × 12	No				
MAX Flow Rate	3 or 4 ml/min	3.5 or 5 ml/min	5 ml/min	20 ml/min	24 ml/min	4.8 L/h	40 L/h
Flow Rate Ratio	3:1		1:1 – 5:1	1:1 – 10:1	1:1 – 9:1	1:1 – 9:1	1:1 – 5:1
Tunable Flow Rate & Ratio	Customer Design		YES				
Inline Dilution	No (dilution in the collection)		Optional		YES		
Inline Monitoring	Pressure		Pressure & Flow Rate				
Consumable Cost per Run	$				$$	$$ (RUO) $$$ (cGMP)	$$$
Dimensions (cm)	32 × 40 × 21	63 × 57 × 66	53 × 27 × 24		42 × 30 × 30	62 × 38 × 43	
Weight (kg)	8.1	50	10.7		35	50	65

Scalable LNP Production

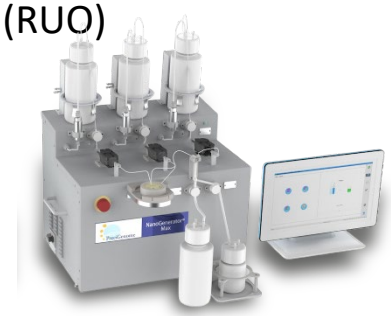
NanoGenerator® Flex-S/Flex-S Plus

Early Screening
0.1 – 2 mL (Flex-S)
0.1 – 0.5 mL (Flex-S Plus)

NanoGenerator® Flex-M/Flex-M Premium

Small/Medium Production
1 – 12 mL (Flex-M)
1 – 200 mL (Flex-M Premium)

NanoGenerator® MAX (RUO)



Large production
50 mL – 1 L
Custom design for larger volume

cGMP solutions

NanoGenerator® MAX Lite (cGMP)

Small/Medium Production
2 – 200 mL

NanoGenerator® Max (cGMP)

Commercial Production
50 mL – 1 L (MAX 4.8L/h);
> 20 L (MAX 40L/h)

OEM

Custom design and OEM solutions
cGMP certified manufacturing
>200 L throughput

Scalable LNP Production

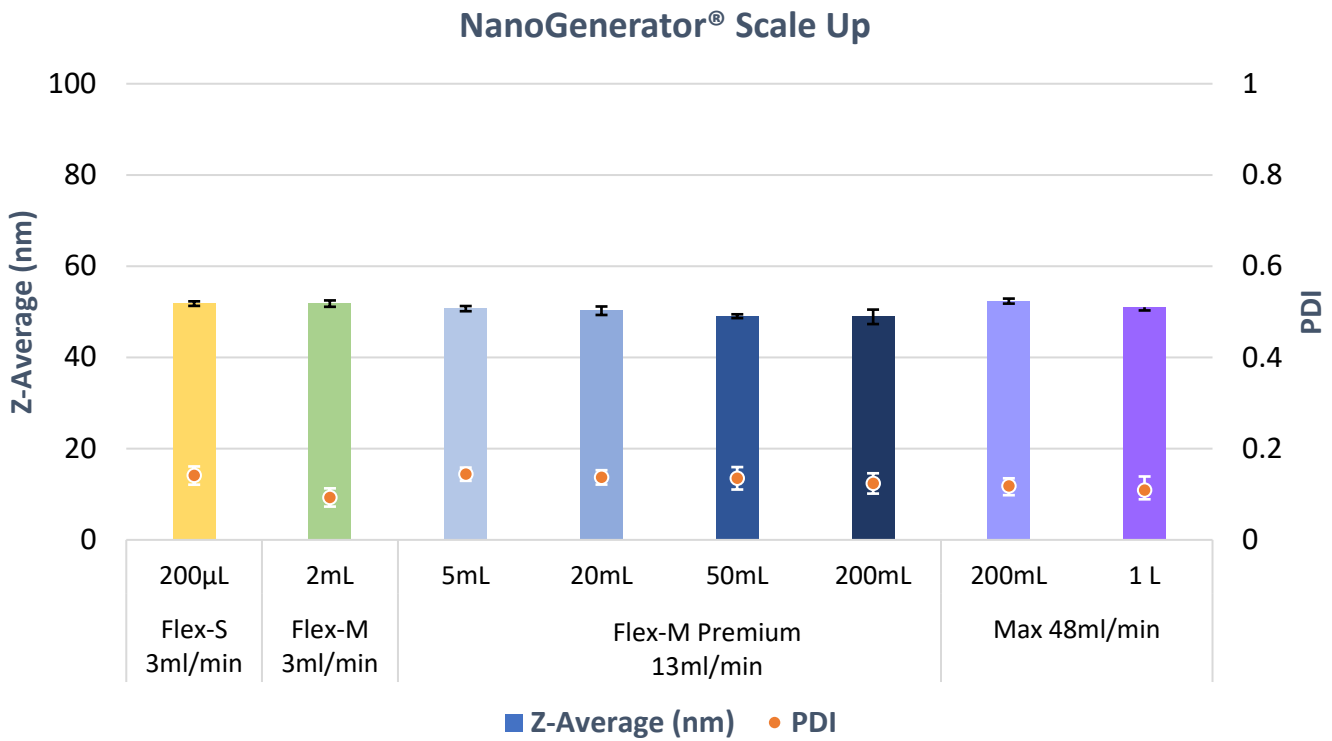
Transferable results from early screening (Flex-S, 0.1mL) to pre-clinical development (Flex-M/M Premium, 12ml/200mL), then clinical studies and production (Max Lite: 200ml Max: 1L, MAX 40L/h: >20L)

- Flex-S: 0.1 – 2 mL
- Flex-S Plus: 0.1 – 0.5 mL

- Flex-M: 1 – 12 mL
- Flex-M Premium: 1 – 200 mL

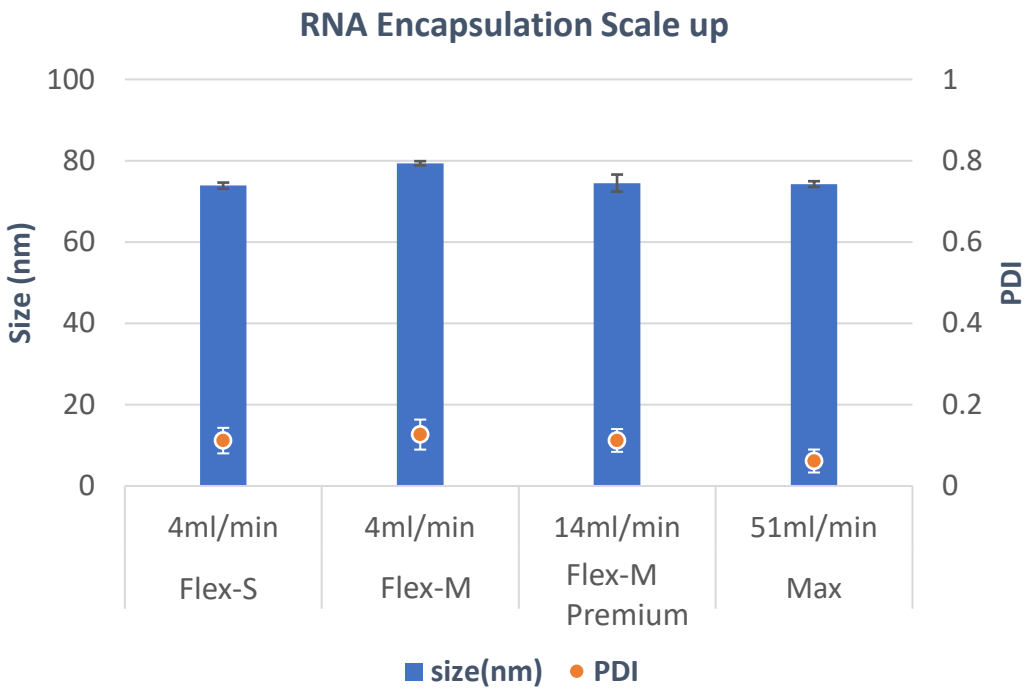
- MAX Lite cGMP : 2 – 200 mL

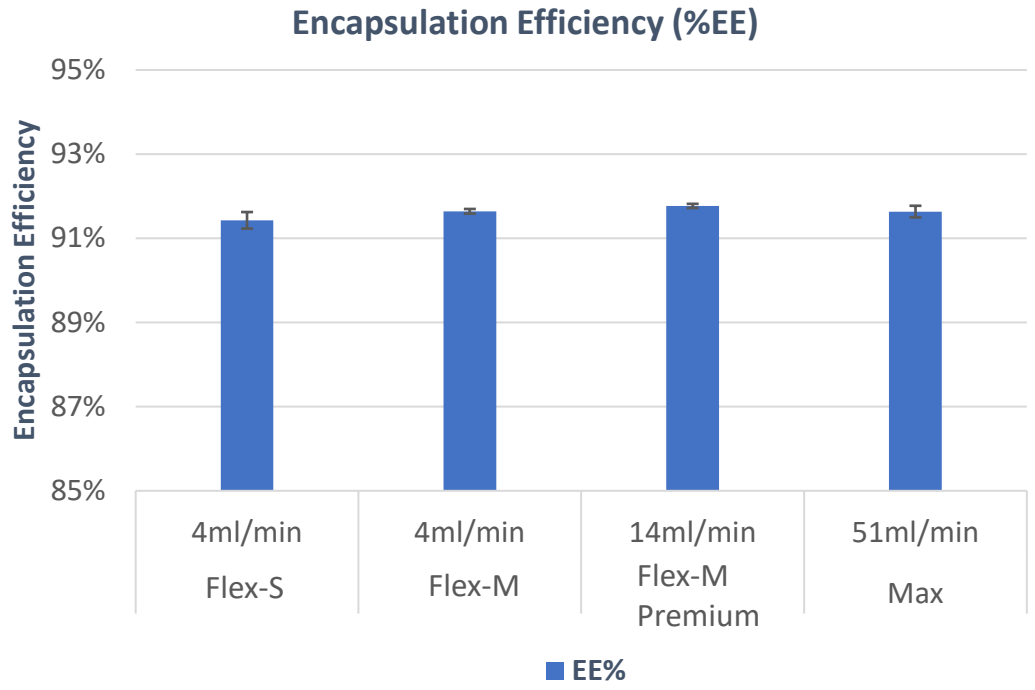
- MAX RUO & cGMP (4.8L/h) : 50 mL – 1 L
- MAX cGMP (40L/h): > 20 L



Reagents	
Aqueous phase	Sodium acetate buffer (100 mM, pH 5.2)
Solvent phase	LipidFlex, 15 mM in ethanol

Scalable LNP Production





	Reagents
Aqueous phase	Sodium acetate buffer (100 mM, pH 5.2)
Payload	RNA (~600 nt)
Solvent phase	LipidFlex RNA-LNP kit

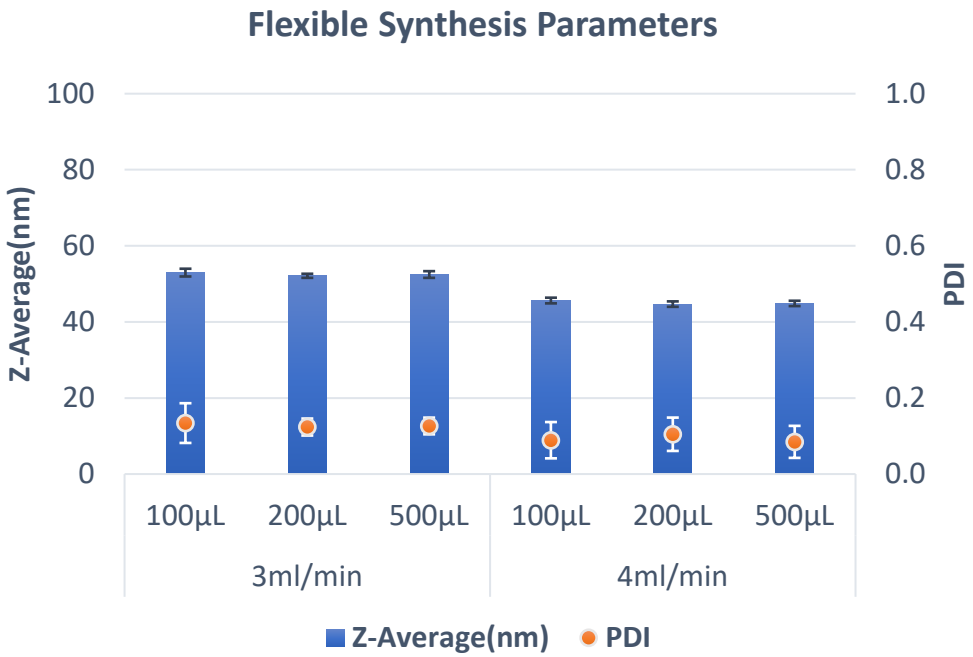
NanoGenerator® Flex-S

- 0.1 – 2 mL synthesis volume per batch
- Tunable total flow rate (3 ml/min & 4 ml/min)
- Customized total flow rate & flow rate ratio available
- Multiple sample synthesis per run available
- Disposable consumables

NanoGenerator® Flex-S

	NanoGenerator Flex-S	Syringe Pump Systems	Tubing Connection Systems
Dead volume per sample	< 20 µL	0.5 mL	0.5 - 1 mL
Source of dead volume	Micro-channel in the mixing chip	Syringe, connector, and/or mixing chip	Tubing, connector, and mixing chip
Typical production volume	0.1 – 0.5 mL	1 – 10 mL	1 – 10 mL
Minimum input volume (Aqueous:Lipid = 3:1)	Aqueous: 75 µl Lipid: 25 µl	Aqueous: 1 mL Lipid: 0.5 mL	Aqueous: 1 mL Lipid: 0.5 mL
Estimated minimum mRNA cost	$50	$660	$660

NanoGenerator® Flex-S

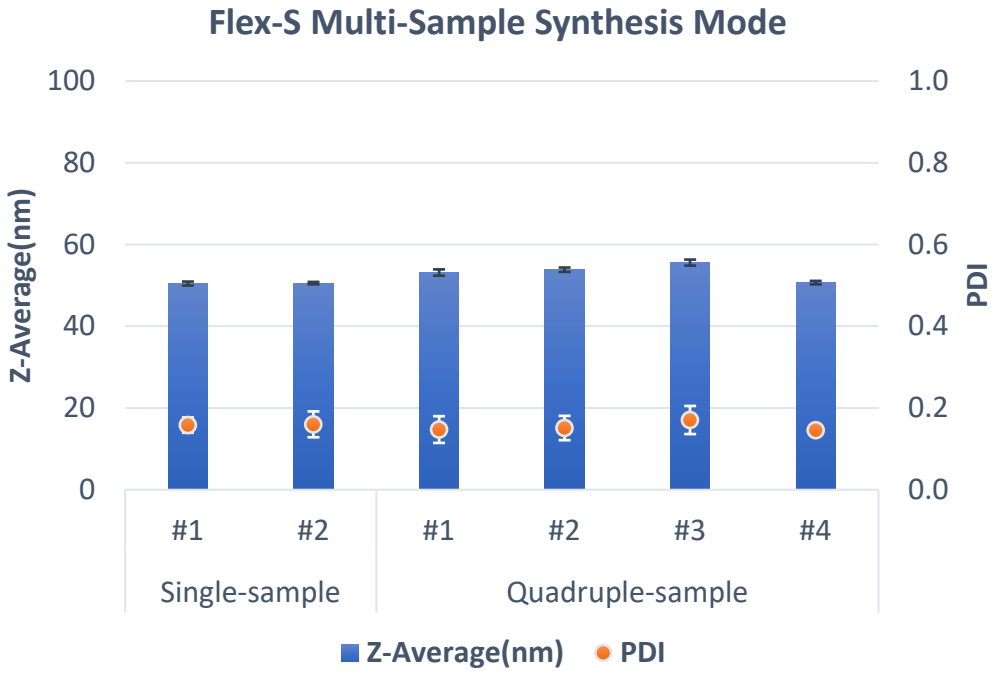


Model	Flex-S
Aqueous phase	Sodium acetate buffer, 100mM, pH 5.2
Solvent phase	LipidFlex, 15mM in ethanol

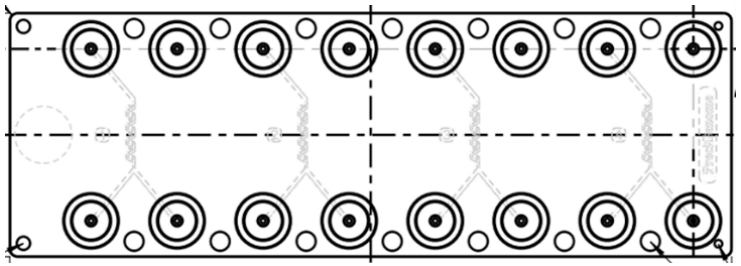
NanoGenerator® Flex-S

- **More total flow rate setting options.**
  - Users can choose **3 mL/min** or **4 mL/min** to conduct LNP synthesis.
  - Higher flow rate setting generates smaller LNPs.
- **Low synthesis volume (100 – 500 μL) per sample**
  - Minimum aqueous sample input volume: 75 μL
  - Minimum Lipid formulation input volume: 25 μL
- **Excellent batch-to-batch consistency**

NanoGenerator® Flex-S



Model	Flex-S
Aqueous phase	Sodium acetate buffer, 100 mM, pH 5.2
Solvent phase	LipidFlex, 15 mM in ethanol



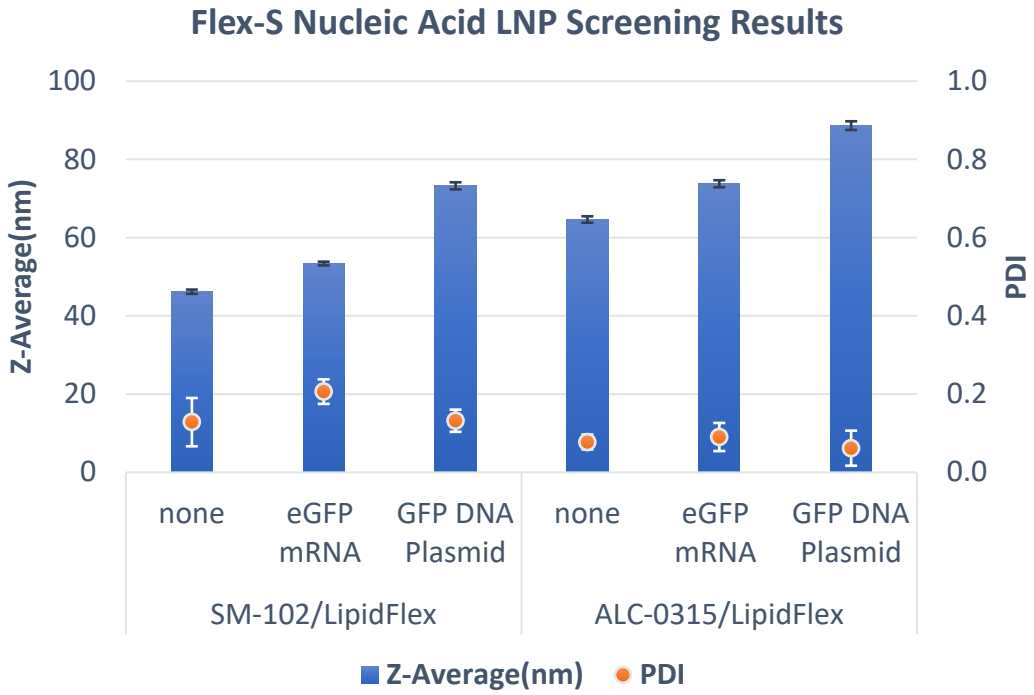
CHP-MIX-4

Multi-sample Synthesis by NanoGenerator® Flex-S:

- **10 seconds, 4 samples.** Users can choose multi-sample synthesis mode to conduct formulation screening. The screening time is as low as 10 seconds

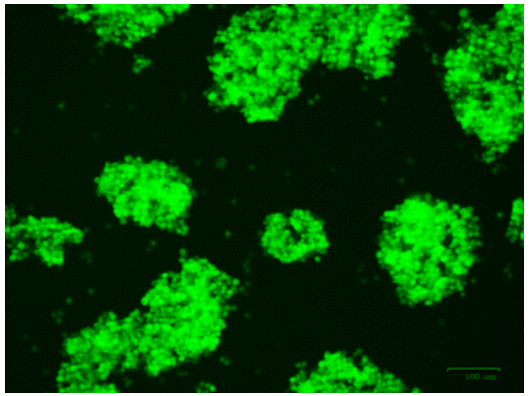
- **Reliable screening results.** Using PreciGenome's advanced air-flow control technology, users can obtain reliable LNP results on both single- and multi-sample synthesis modes.

NanoGenerator® Flex-S



Model	Flex-S
Aqueous phase	100 µg/mL eGFP mRNA (CATUG) or GFP DNA (ALDEVRON) in sodium acetate buffer (100 mM, pH 5.2)
Solvent phase	Ionizable lipid/LipidFlex, 40/60, 12.5 mM in ethanol

eGFP mRNA LNP Delivery to Jurkat Cells



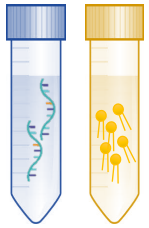
Jurkat Cells transfected with eGFP mRNA LNP. Green fluorescence image at 48 hours post transfection.

- **Robust Formulation Screening.**
  Using NanoGenerator® Flex-S, users can conduct formulation screening with low reagent consumption for high cost savings.

- LNP size and PDI depend on the payload and formulation choice.

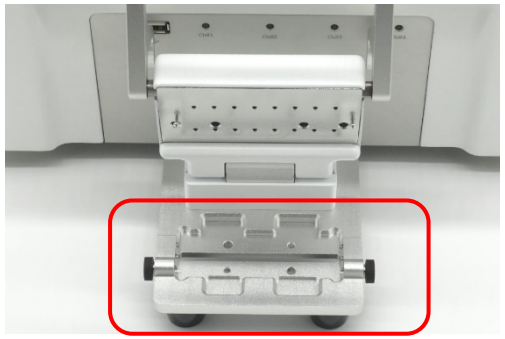
Flex-S workflow

Step 1: Preparation

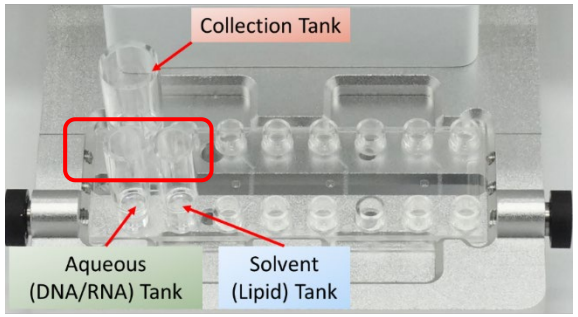


Aqueous: DNA, mRNA in buffer
Solvent: lipid mix in ethanol
(Lipid-Flex formulation)

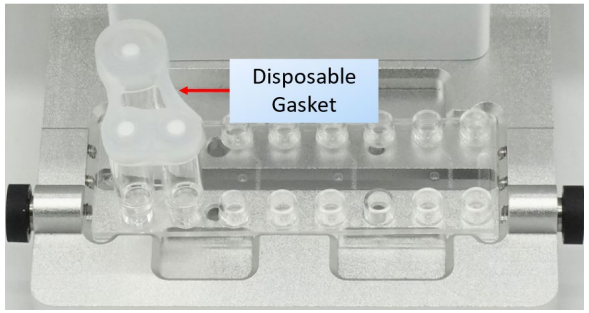
Step 2: Load chip



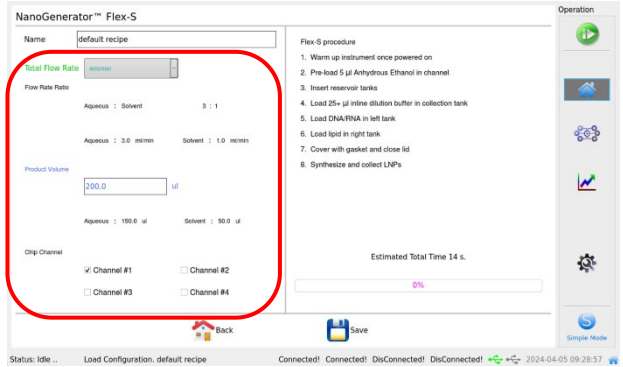
Step 3: Load samples



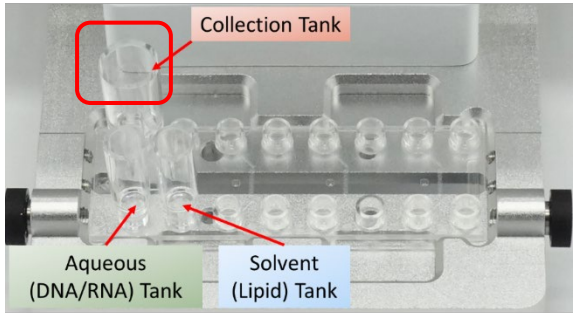
Step4: Put on Gasket



Step 5: Set Parameters and Run



Step 6: Collect LNPs in seconds



Demo video: PreciGenome Lipid Nanoparticle Synthesis System NanoGenerator (3rd gen) Flex-S Demo and Introduction (youtube.com)
Demo video (multi-channel synthesis): 4 Samples per run for Lipid Nanoparticle Synthesis, NanoGenerator (3rd gen) Flex-S Demo (youtube.com)

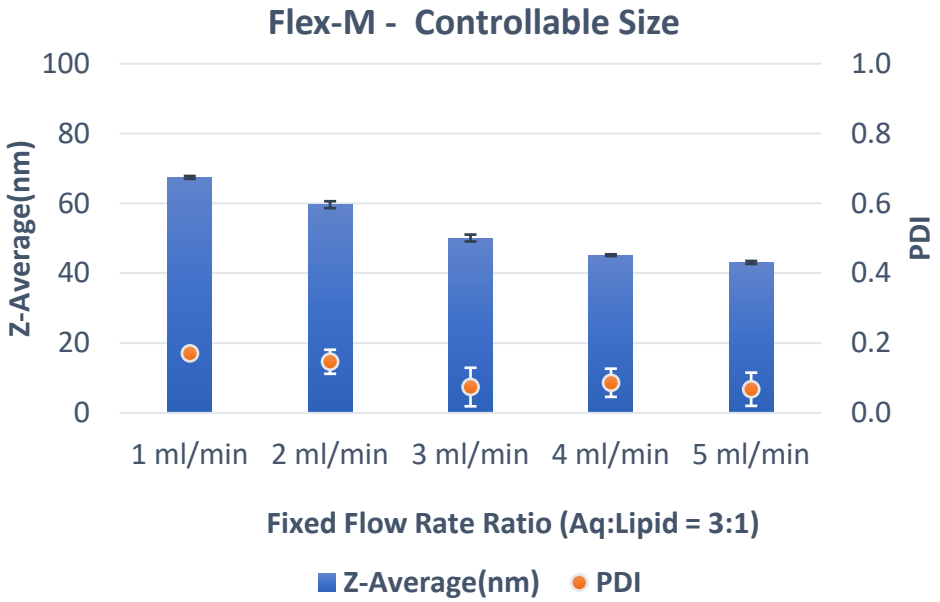
Consumables For Flex-S

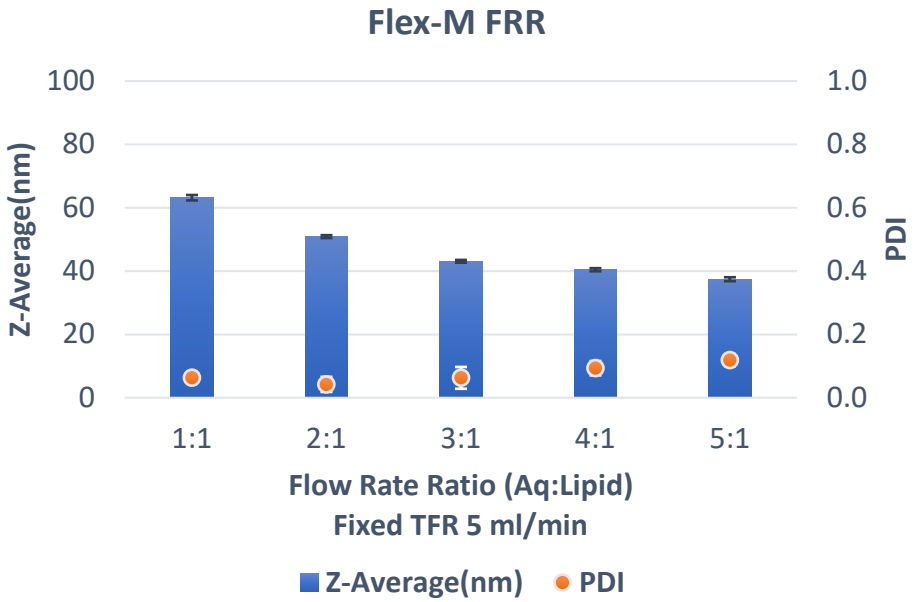
Catalogue number or brand	Items	Description
CHP-MIX-4	Mix-4 mixing cartridge	Microfluidic mixing chip for Flex-S & Flex-M, 4 devices per chip
PG-MRC-SYNS-Q20	Reservoir connector	Reagent reservoirs for Flex-S, 20 pcs/pack
PG-GSK-SYNS-Q20	Flex-S gasket	Gaskets for Flex-S, one per device, 20 pcs/pack
PG-GSK-SYNS4-Q5	Gasket sheet for Flex-S	Gasket sheet for Flex-S; One per chip (4 samples); 5 pcs/pack

NanoGenerator® Flex-M

- 1 – 12 mL synthesis volume per batch
- Tunable total flow rate (TFR, 1 – 5 ml/min) and flow rate ratio (FRR, 1:1 to 5:1) in Flex-M

NanoGenerator®
Flex-M/Flex-M Premium



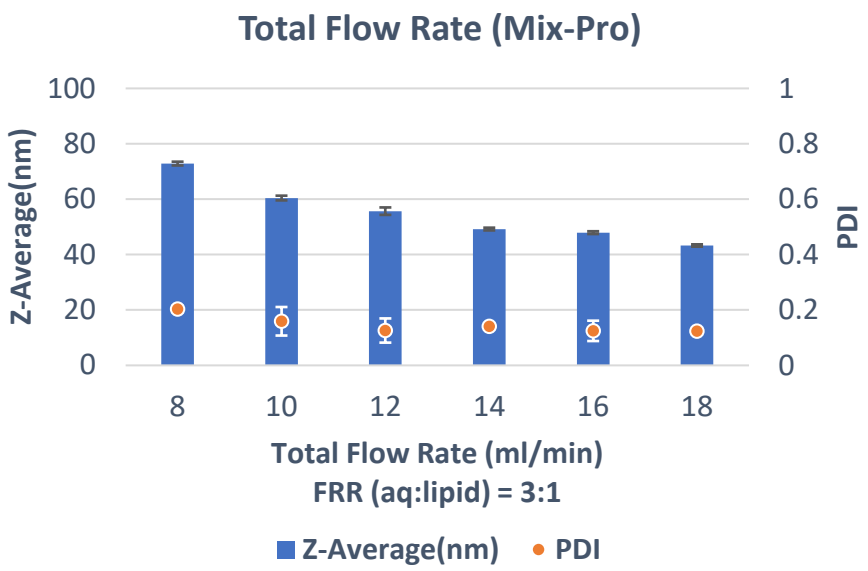


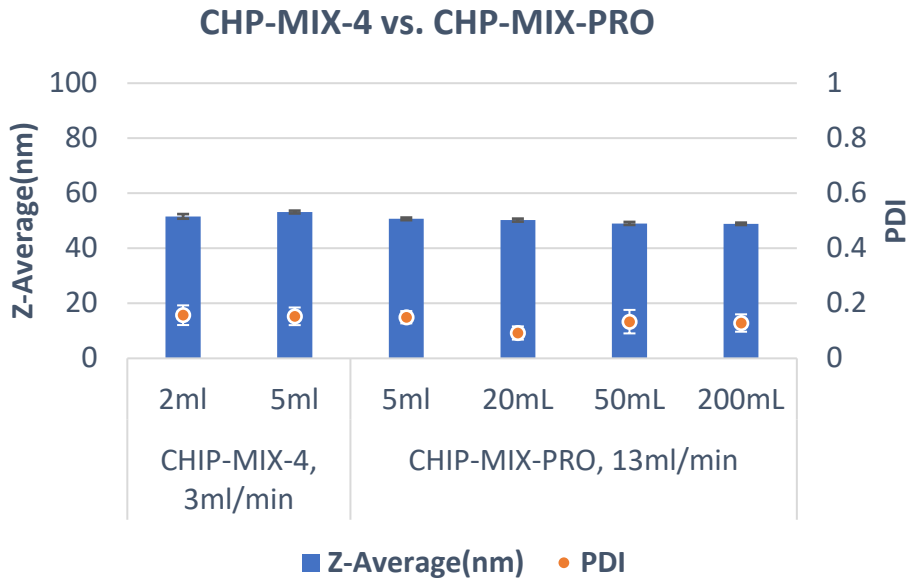
Model	Flex-M
Aqueous phase	Sodium acetate buffer 100 mM, pH 5.2
Solvent phase	LipidFlex, 15 mM in ethanol

Upgrade Flex-M to Flex-M Premium

- Extended synthesis volume per batch up to 200 mL
- Tunable total flow rate (TFR, 1 – 5 ml/min) and flow rate ratio (FRR, 1:1 to 10:1) in Flex-M with MIX-4
- Compatible with CHP-MIX-PRO Chip (up to 20 ml/min)

NanoGenerator®
Flex-M Premium





CHP-MIX-PRO

- Total flow rate: up to 20 ml/min
- Throughput: 5-200 ml

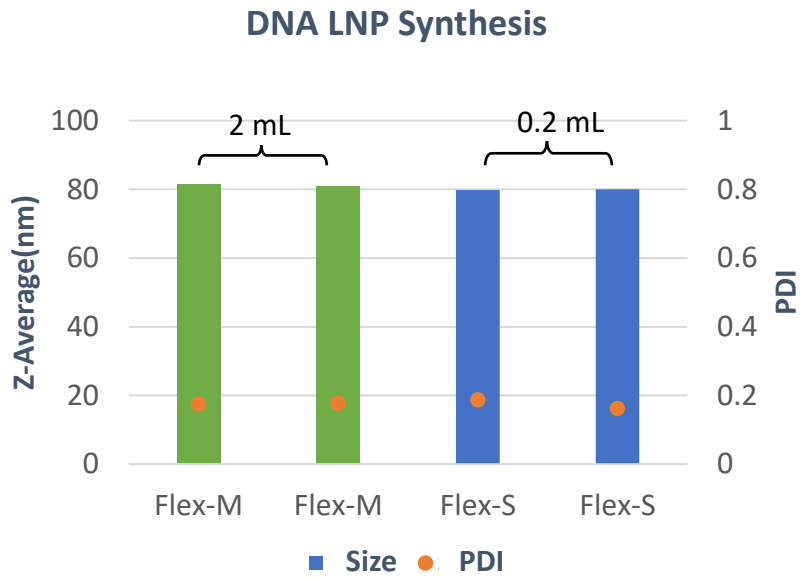
Model	Flex-M/Flex-M Premium
Aqueous phase	Sodium acetate buffer 100 mM, pH 5.2
Solvent phase	LipidFlex, 15 mM in ethanol

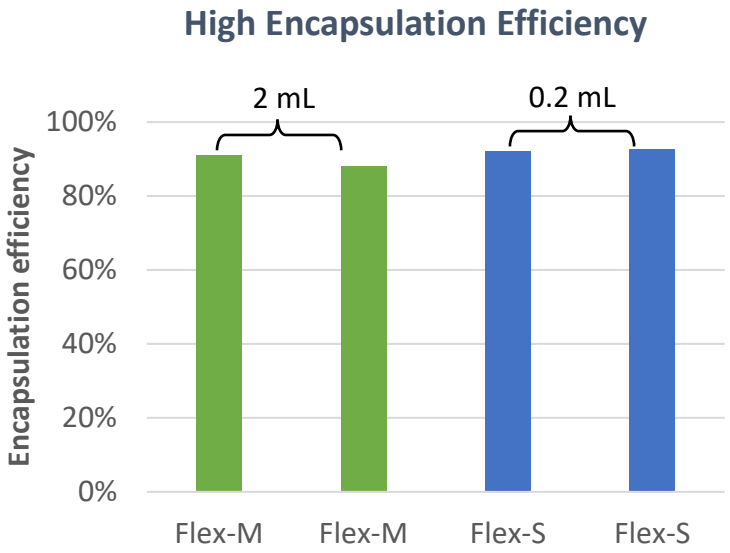
Transferable results between Flex-S/M

- The mixing chip (CHP-MIX-4) is compatible with both Flex-S and Flex-M models.
- Customer can transfer their early screening results to later stage production seamlessly.

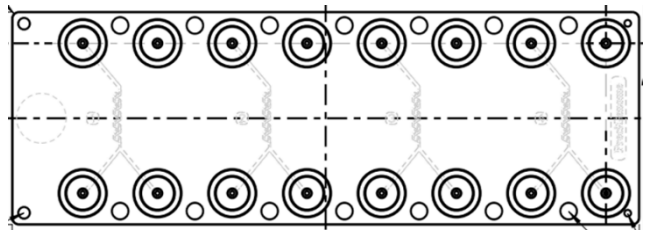
NanoGenerator® Flex-S

NanoGenerator®
Flex-M/Flex-M Premium





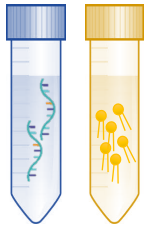
Model	Flex-S/M
Aqueous phase	GFP DNA plasmid (100 μg/mL) in sodium acetate buffer(100 mM, pH 5.2)
Solvent phase	SM102/Lipidflex (40/60 mol%, 12.5 mM total lipid concentration) in ethanol
N/P ratio	6



CHP-MIX-4

Flex-M/Flex-M Premium workflow

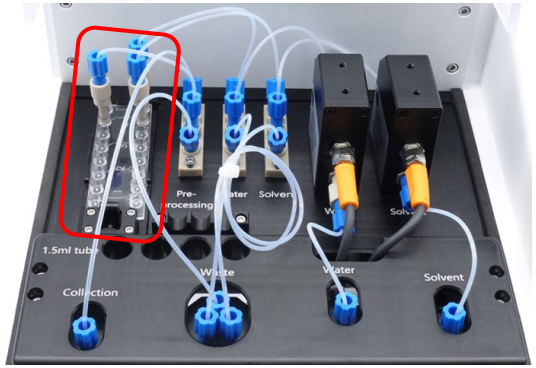
Step 1: Preparation



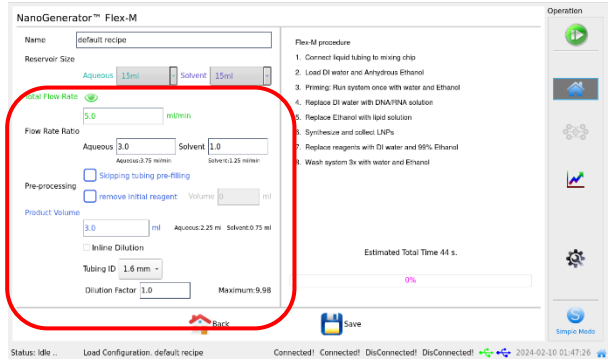
Aqueous: DNA, mRNA in buffer
Solvent: lipid mix in ethanol
(Lipid-Flex formulation)

Step 2: Load sample tubes and collection tube

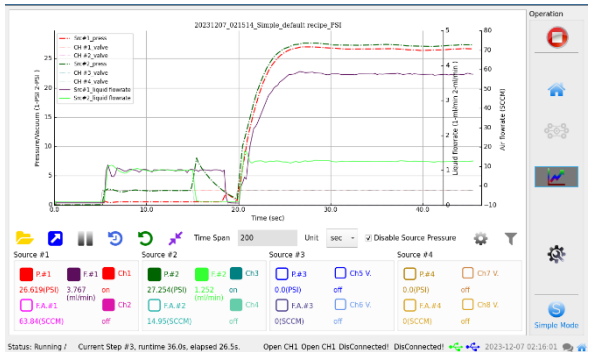
Step 3: Load chip



Step 4: Set parameters and Run



Step 5: Monitor flow rates



Step 6: Collect LNPs in seconds

Demo video: [NanoGenerator Flex-M (3rd Gen) Demo for Lipid Nanoparticles LNP, liposome synthesis (youtube.com)]

Consumables for Flex-M/Flex-M premium

Catalogue number or brand	Items	Description
CHP-MIX-4	Mix-4 mixing cartridge	Microfluidic mixing chip for Flex-S & Flex-M, 4 devices per chip
CHIP-MIX-PRO	Mix-Pro chip	Microfluidic mixing chip for Flex-M premium, 1 device per chip
CHP-MIX-G1	Glass mixing chip	Glass microfluidic mixing chip
PG-MNT-CHP-2	Glass mixing chip holder	Chip holder for glass mixing chip
KIT-TUB-FIT-FM	Flex-M tubing kit	Tubing and Connector Kit for Flex-M

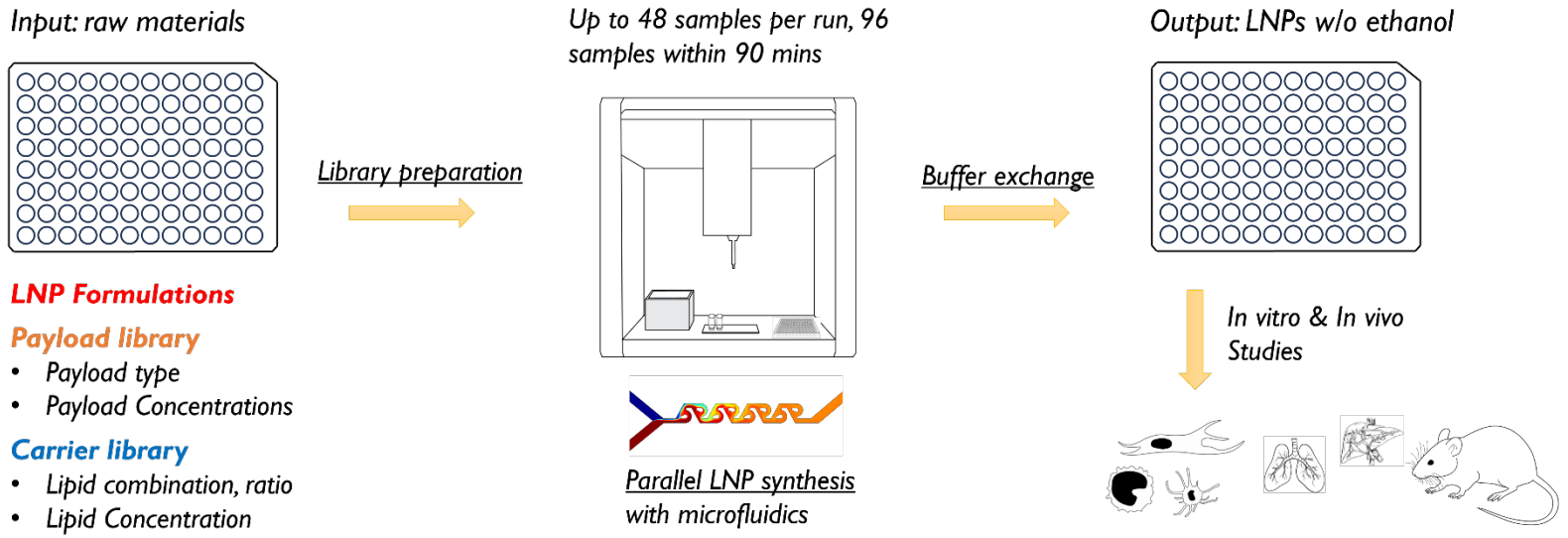
NanoGenerator® Flex-S Plus

NanoGenerator®
Flex-S Plus

- Rapid screening of LNP formulations
- Rapid screening of mRNA/siRNA
- 48 samples per run
- 96 samples within 1.5 hours
- Disposable consumables

Model	Flex-S	Flex-S Plus
Multi-sample per run	1 – 4	(1 – 12) × 4 per run Up to 96 samples per hour
Full automation	N/A	Yes
Library preparation	N/A	Optional
Throughput	0.1 – 0.5 ml per sample	0.1 – 0.5 ml per sample
Total flow rate	3 ml/min, 4 ml/min	3.5 ml/min, 5 ml/min
Flow rate ratio	3:1	3:1
Custom design flow rate	Yes	Yes
Size range	40 – 200 nm	40 – 200 nm
PDI	0.05 – 0.2	0.05 – 0.2
Encapsulation efficiency	Up to 99%	Up to 99%
Payload	DNA, mRNA, siRNA, Protein, small molecules, etc.	DNA, mRNA, siRNA, Protein, small molecules, etc.
Dimension	320 mm × 400 mm × 210 mm	630 mm × 570 mm × 660 mm
Weight	8.1 kg	50 kg

NanoGenerator® Flex-S Plus workflow



NanoGenerator®
Flex-S Plus

Workflow:

1. Load raw materials in 96 well plates
2. Seal the 96 well plates (optional)
3. Put consumables on the deck: chips, 96 well plates, pipette tips, and gaskets
4. Set parameters in the software and run the program (library prep & buffer exchange are optional)
5. Collect samples in 96 well plate
6. Discard/change consumables

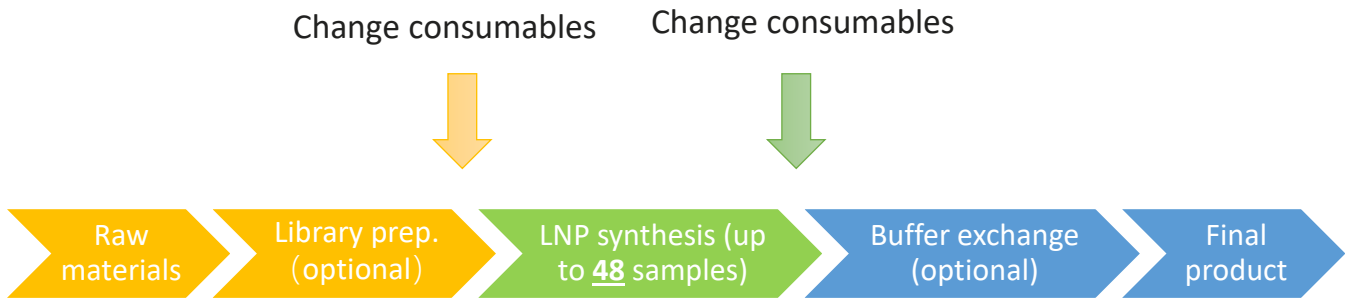
Demo video: [Demo of NanoGenerator® Flex-S Plus Platform, Automated High-throughput LNP Preparation & formulation]

NanoGenerator® Flex-S Plus workflow

One instrument: offering two workflows

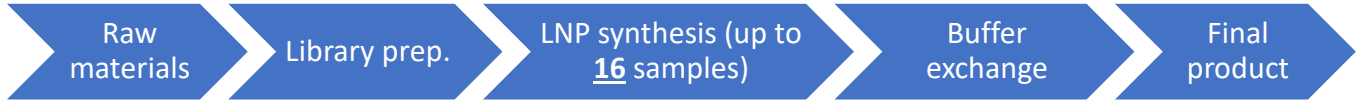
- High throughput workflow
- Automation workflow

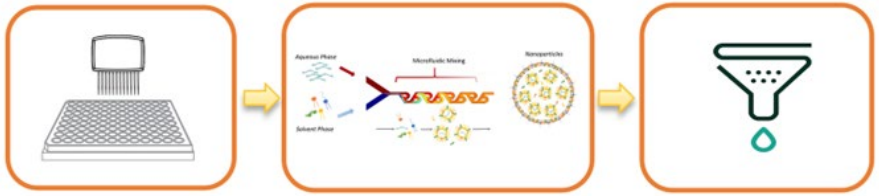
- **High throughput workflow**



- **Automation workflow**

(no need to change consumable)



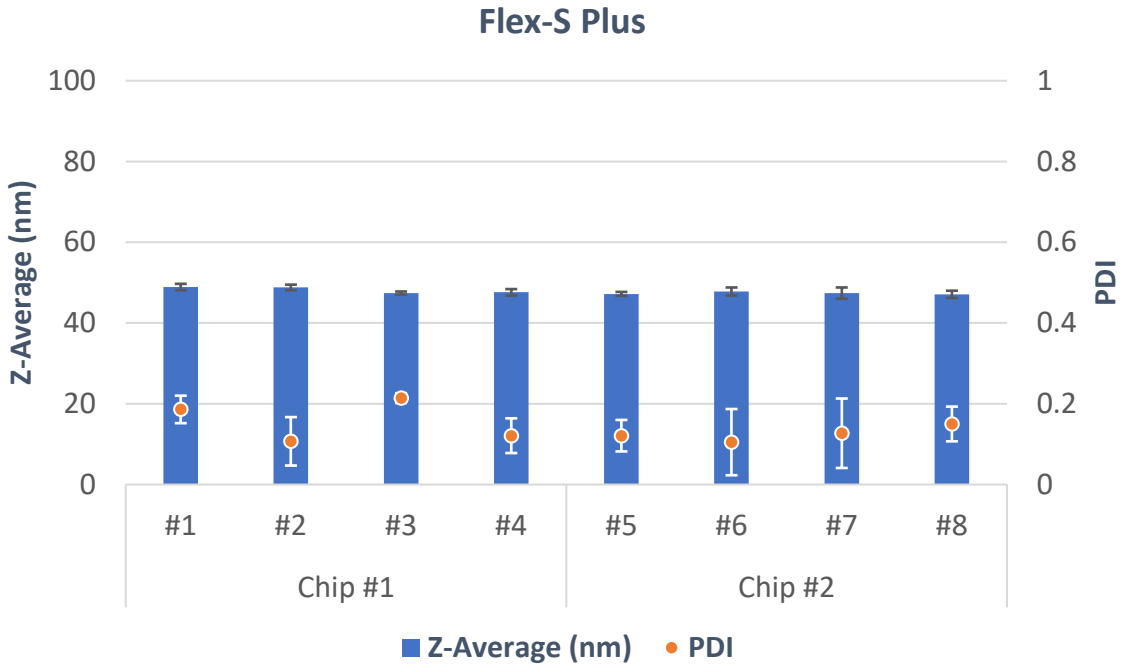


Lipid & API Preparation

LNP Synthesis

Solvent & free payload removal

NanoGenerator® Flex-S Plus



- Robust multi-sample synthesis
- Reliable performance
- Consistent results

Model	Flex-S Plus
Aqueous phase	Sodium acetate buffer 100 mM, pH 5.2
Solvent phase	LipidFlex, 15 mM in ethanol
Parameters	3.5 ml/min, FRR 3:1, 200 µL

NanoGenerator® Flex-S Plus

Size (nm)

54.9	45.4	45.5	55.5
54.4	47.6	45	46.2
54.7	46.5	47.4	62.3
54.4	48.2	51.9	57.3
42.6	47.8	44.8	51.2
41.1	50	46.9	48.2
62.8	48.5	46.7	74
56.6	50.7	52.1	59.2

40 80

PDI

0.216	0.13	0.126	0.473
0.175	0.107	0.092	0.08
0.185	0.09	0.104	0.113
0.16	0.1	0.137	0.107
0.306	0.121	0.101	0.403
0.063	0.129	0.128	0.124
0.118	0.066	0.148	0.109
0.041	0.099	0.163	0.113

0.02 0.50

- 32 sample screening (formulation & N:P ratio screening)
- 96 samples in 1.5 hours
- 96-well plate format

Model	Flex-S Plus
Aqueous phase	RNA in Sodium acetate buffer 100 mM, pH 5.2
Solvent phase	Different lipid formulation

Consumables for Flex-S Plus

Catalogue number or brand	Items	Description
KIT-SP-MIX4G-Q96	Chip & gasket package	Each package contains 24 chips and 24 gasket sheets; For 96 samples
CHP-MIX4-Q24	Chip for Flex-S plus	Qty: 96 samples pack, including mixing chips and reagent reservoirs, 24pcs (4 samples/pc).
PG-GSK-SP-Q24	Gasket sheets for Flex-S plus	Qty: 96 samples pack, including gasket 24pcs (4 samples/pc).
PG-PTIP200-Q960	200 µl pipette tip with filter	Boxes of pipette tips with filter for transferring solutions. 960 tips, 10 racks per pack
NEST® Wuxi NEST Biotechnology	Full skirt 100 µl 96-well PCR plate	For dilution buffer, aqueous samples, solvent samples or collection samples
Eppendorf® Eppendorf SE	Semi-skirt 200 µl 96-well PCR plate	For dilution buffer, aqueous samples, solvent samples or collection samples; Need to be used with 96-well plate holders
Any brand	Full skirt 300 µl 96-well cell culture plate	For collection samples
NEST® Wuxi NEST Biotechnology	Deep well 1 ml 96-well plate	For dilution buffer, aqueous samples, or collection samples
Nunc™ 96-Well	Deep well 1300 µl 96-well plate	For dilution buffer, aqueous samples, or collection samples
PG-P96-FOIL-Q100	Aluminum foil	To seal the 96-well plate
PG-SSEAL-Q10	Slit seal	96-well plate seal, allowing muti-times insertion and withdrawal of pipette tips
PG-SSEAL-STZ-Q10	Slit seal (Sterilized)	96-well plate seal, allowing muti-times insertion and withdrawal of pipette tips

Case Study I: mRNA LNP for T cell Transfection

eGFP mRNA Lipid Nanoparticles by Flex-S

Z-Average Diameter: 67.3 nm

PDI: 0.106

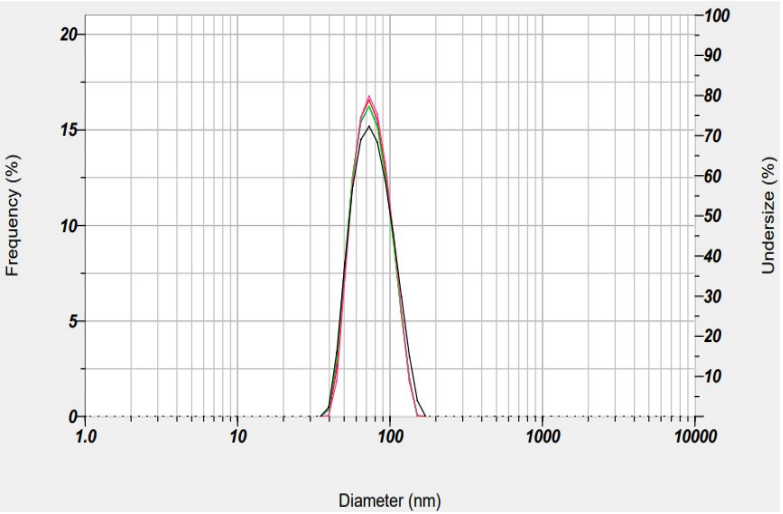


Figure 1. mRNA(eGFP)-LNP Synthesized by NanoGenerator® Flex-S. Average diameter is 67.3 nm. PDI is 0.106. Encapsulation efficiency is 94.5% (Ribo Green RNA Quantification Kit).

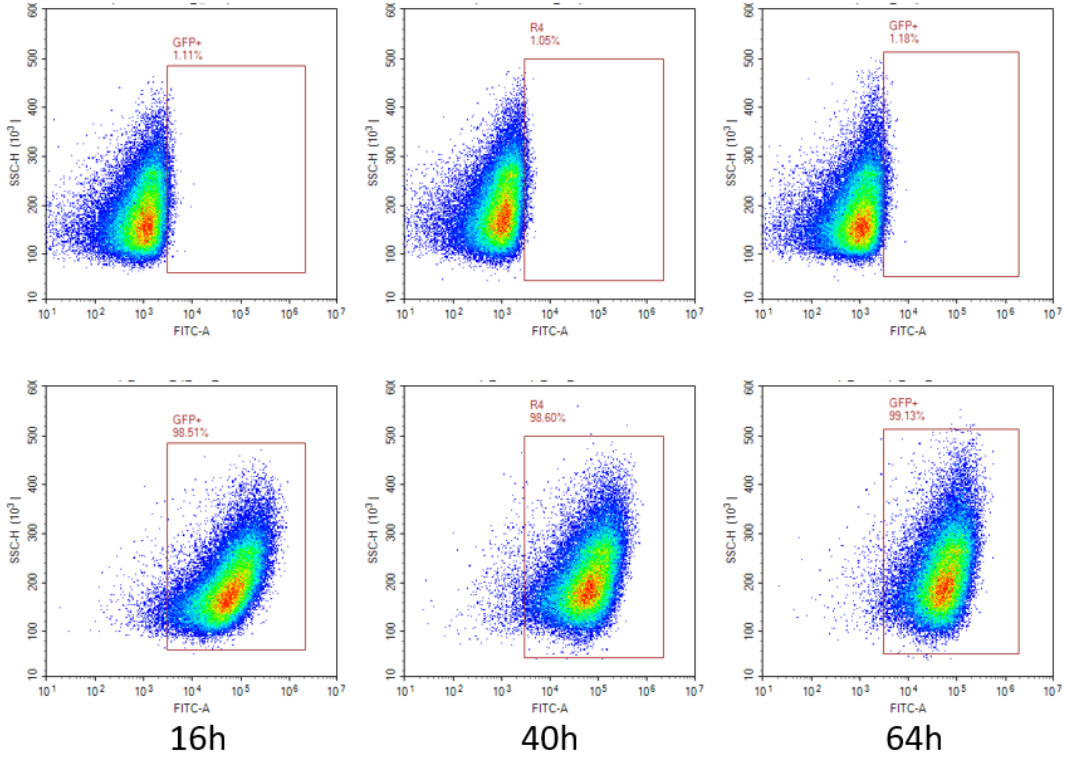
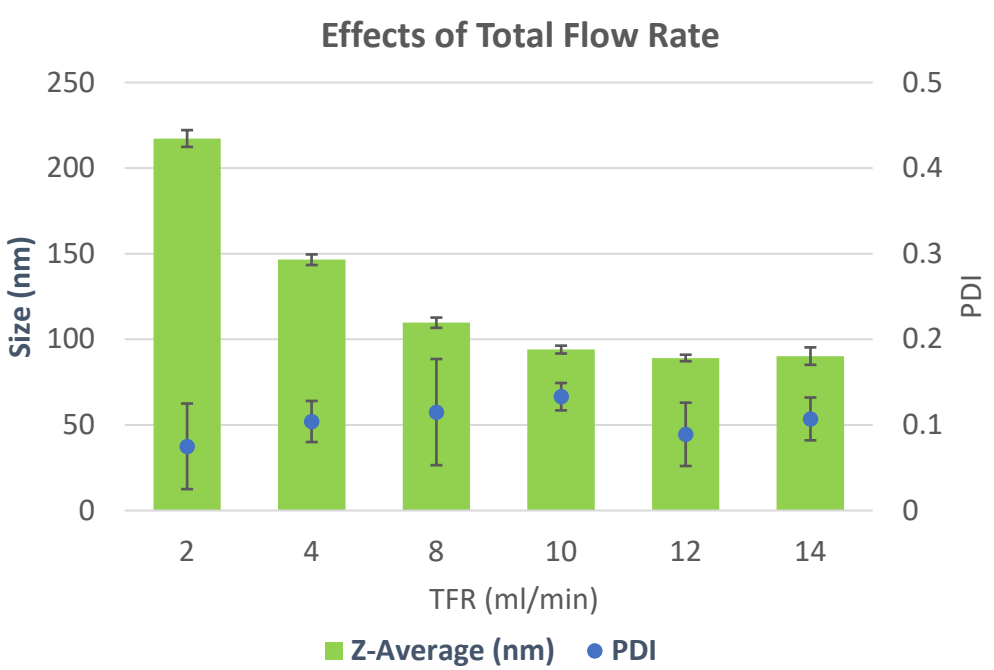


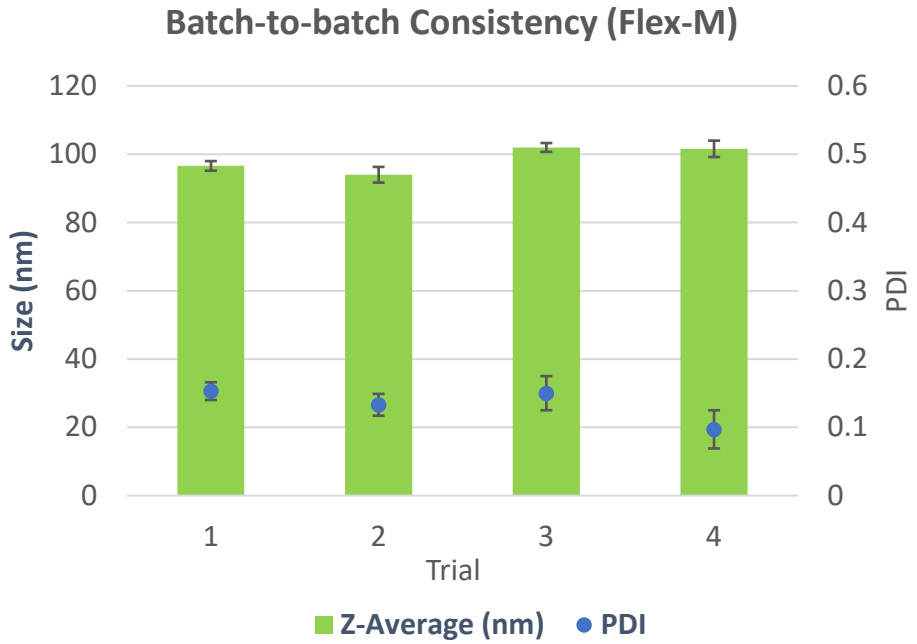
Figure 2. GFP(+) positive population of control (non-treat) and EGFP mRNA LNP treated primary T cells at 16, 40 and 64 hours. Cells were stained (1:50) using Biolegend 7-AAD Viability Staining for 10 minutes. Gating: First select for individual cells (excluding doublets). Then select for the healthy cell population. Then select for viable cells by excluding cells which are positive for 7-AAD. Gate for FitC-A channel (GFP)

Case Study II: PLGA Nanoparticle Synthesis

- PreciGenome's NanoGenerator® can be used for a variety of nanoparticles, including PLGA (poly(lactic-co-glycolic acid)) nanoparticles

- PLGA NP size tuning is controlled by the formulation parameters, the total flow rate and the flow rate ratio





Recent Publications

Small Molecules

Contents lists available at ScienceDirect
International Journal of Pharmaceutics
journal homepage: www.elsevier.com/locate/ijpharm

Lipid nano-vesicles for thyroid hormone encapsulation: A comparison between different fabrication technologies, drug loading, and an *in vitro* delivery to human tendon stem/progenitor cells in 2D and 3D culture

E.P. Lamparelli [a], M.C. Ciardulli [a], P. Scala [a], M. Scognamiglio [b], B. Charlier [a], P. Di Pietro [a], V. Izzo [a], C. Vecchione [a,c], N. Maffulli [a], G. Della Porta [a,b,d,*]

[a] Department of Medicine, Surgery and Dentistry, University of Salerno, Via S. Allende, 84081 Baronissi, (SA), Italy
[b] Department of Industrial Engineering, Università di Salerno, via Giovanni Paolo I, 84084 Fisciano, (SA), Italy
[c] IRCCS Neuromed, Department of Vascular Physiopathology, 86077 Pozzilli, IS, Italy

mRNA

PNAS

Identification of a protective antigen reveals the trade-off between iron acquisition and antigen exposure in a global fungal pathogen

Yeqi Li, Tuyetnhu Pham, Kenton Hipsher, +9, and Xiaorong Lin Authors Info & Affiliations

Edited by Jay Dunlap, Dartmouth College Geisel School of Medicine, Hanover, NH; received October 17, 2024; accepted January 9, 2025

February 13, 2025 | 122 (7) e2420898122 | https://doi.org/10.1073/pnas.2420898122

JEM Journal of Experimental Medicine

BRIEF DEFINITIVE REPORT

Regenerating murine CD8⁺ lung tissue resident memory T cells after targeted radiation exposure

Mariah Hassert, Lecia L. Pewe, Rui He, Mohammad Heidarian, Pornpoj Phruttiwanichakun, Stephanie van de Wall, Madison R. Mix, Alasgar K. Salem, Vladimir P. Badovinac, and John T. Harty

CRISPR-Cas mRNA+gRNA

bioRχiv THE PREPRINT SERVER FOR BIOLOGY

Engineering circular guide RNA and CRISPR-Cas13d-encoding mRNA for the RNA editing of *Adar1* in triple-negative breast cancer immunotherapy

Shurong Zhou, Suling Yang, Jie Xu, Guizhi Zhu

doi: https://doi.org/10.1101/2025.07.22.666181

SiRNA

POSTER PRESENTATIONS - PROFFERED ABSTRACTS | MARCH 22 2024

Abstract 4607: Targeted nanoparticle delivery of irinotecan and Ewing sarcoma-specific siRNA is an effective combination therapy for Ewing sarcoma FREE

Sheetal A. Mitra; Jean-Hugues Parmentier; Hyung-Gyoo Kang; Timothy J. Triche

Check for updates

+ Author & Article Information

Cancer Res (2024) 84 (6_Supplement): 4607.
https://doi.org/10.1158/1538-7445.AM2024-4607

CANCER RESEARCH

CRISPR-Cas RNP

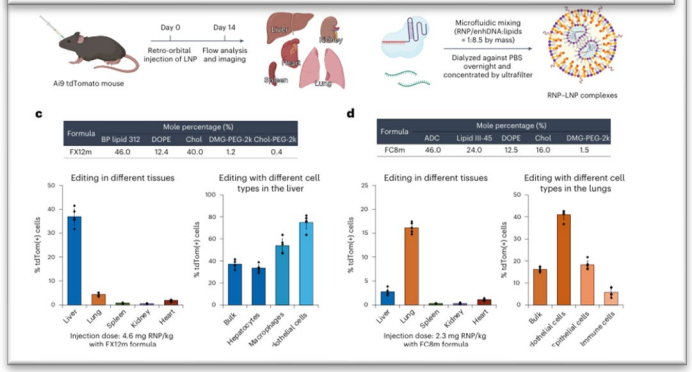
nature biotechnology

Article https://doi.org/10.1038/s41587-024-02437-3

Lung and liver editing by lipid nanoparticle delivery of a stable CRISPR–Cas9 ribonucleoprotein

Received: 23 October 2023
Accepted: 18 September 2024

Kai Chen, Hesong Han, Sheng Zhao, Bryant Xu, Boyan Yin, Atip Lawanprasert, Marena Trinidad, Benjamin W. Burgstone, Niren Murthy & Jennifer A. Doudna



Protein/ Peptide

Article | Open access | Published: 22 February 2025

Anionic lipids direct efficient microfluidic encapsulation of stable and functionally active proteins in lipid nanoparticles

Suresh Ambati, Yeqi Li, Matthew K. Whittaker, Eileen J. Kennedy, Wided N. Missaoui, Xiaorong Lin, Zachary A. Lewis & Richard B. Meagher

Communications Materials **6**, Article number: 34 (2025) | Cite this article

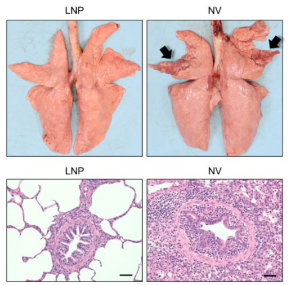
DNA

AMERICAN SOCIETY FOR MICROBIOLOGY | mSphere

RESEARCH ARTICLE
August 2024 Volume 9 Issue 8 e00283-24
https://doi.org/10.1128/msphere.00283-24

Lipid nanoparticle-encapsulated DNA vaccine confers protection against swine and human-origin H1N1 influenza viruses

The N. Nguyen [1,2], Danh C. Lai [1,2], Sarah Sillman [2], Erika Petro-Turnquist [1,3], Eric A. Weaver [1,3], Hiep L. X. Vu [1,4]



PLGA

International Journal of Pharmaceutics
Volume 667, Part B, 25 December 2024, 124934

PLA/PLGA nanocarriers fabricated by microfluidics-assisted nanoprecipitation and loaded with Rhodamine or gold can be efficiently used to track their cellular uptake and distribution

E.P. Lamparelli [a], M. Marino [a], M.R. Scognamiglio [b], R. D'Auria [a], A. Santoro [a,c,1], G. Della Porta [a,c,1]

PreciGenome

LipidFlex™ – Flexible Starting Kit

LipidFlex™

Flexible Lipid Nanoparticle Formulation

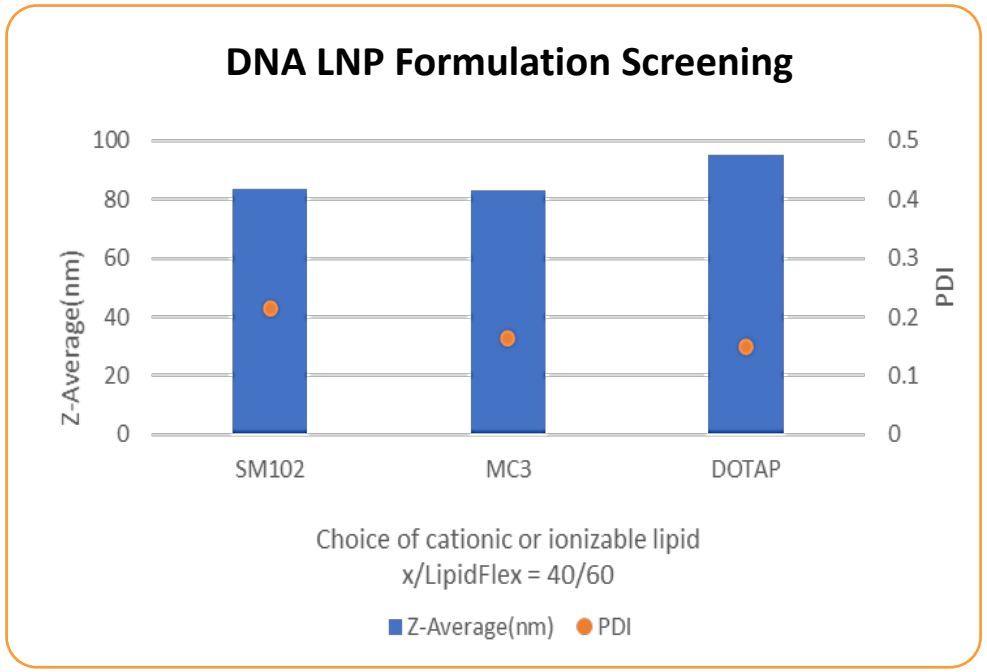
LipidFlex™ is a 3-component lipid nanoparticle formulation that compatible with various cationic/ ionizable lipids for nucleic acid encapsulation and cell transfection. LipidFlex™ Pack kit includes ionizable lipid (SM102).

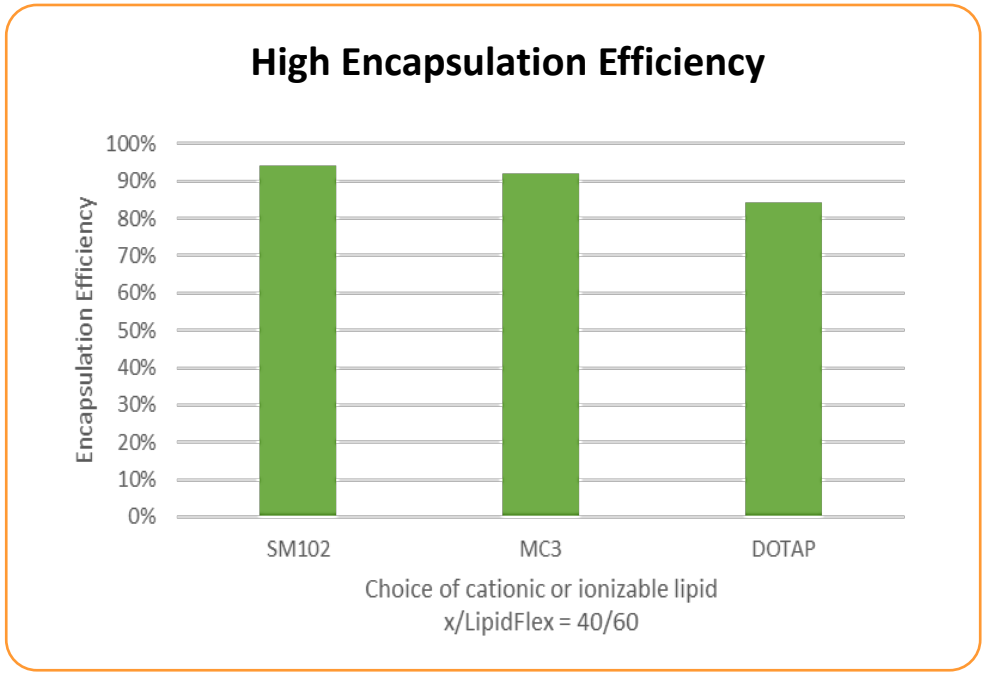
- Flexible cationic/ionizable lipid ratio
- Flexible with various N/P ratio
- High nucleic acid encapsulation efficiency
- High mammalian cell transfection rate

Model	LipidFlex™
Catalog #	PG-SYN-LF1ML
Components	Structural Lipid/ Cholesterol/Stabilizer
Product size	1000 µL
LipidFlex Conc.	30 mM
Ionizable lipid	NA

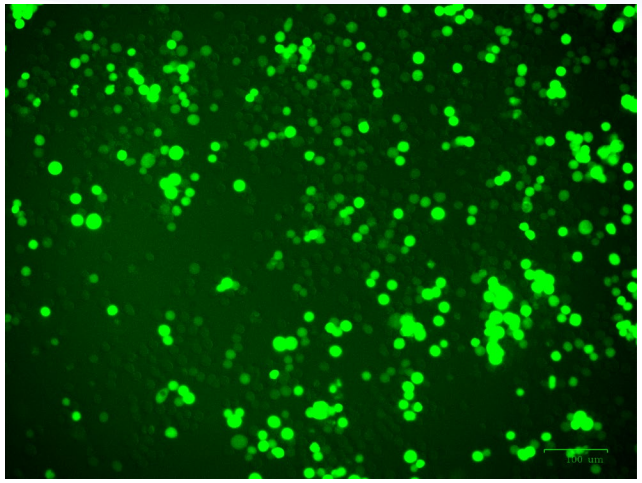
LipidFlex™ – Flexible Starting Kit

- PreciGenome provides a general LipidFlex™ formulation for quick formulation screening.
- By adding cationic/ionizable lipid into LipidFlex™, customers can prepare nucleic acid LNPs with high encapsulation efficiency

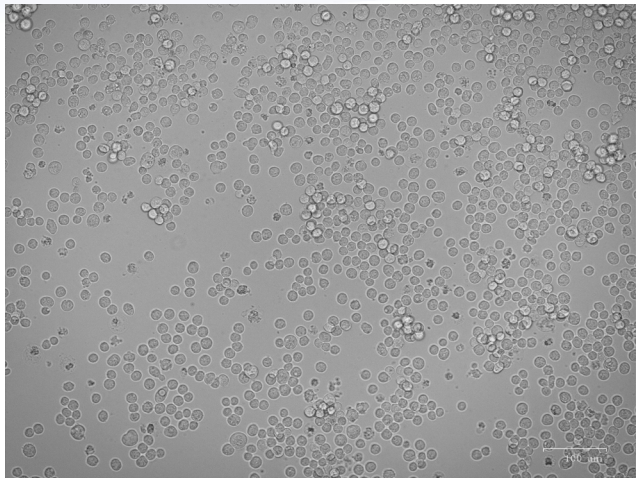




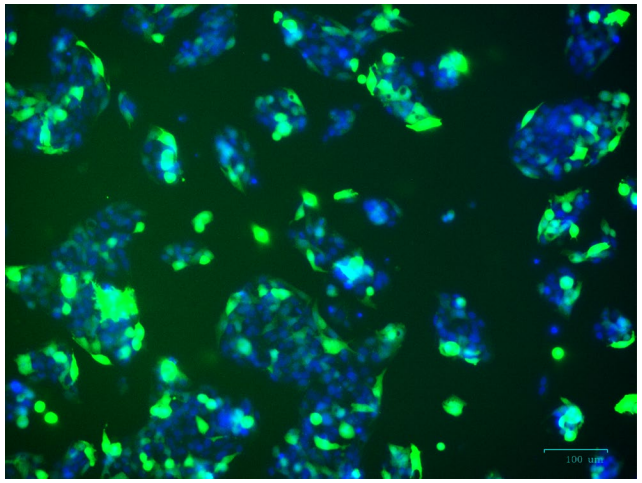
LipidFlex™ LNP – Cell Transfection to Different Cells



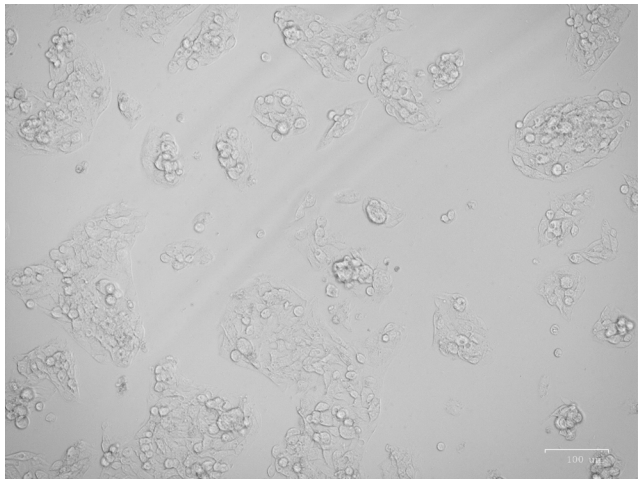
K562 – Green Fluorescence Field



K562 –Bright Field



HepG2 – Green and Blue field overlay

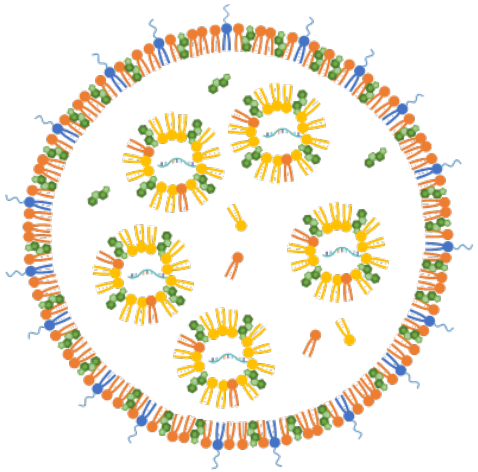


HepG2 –Bright Field

- DNA lipid nanoparticle (gWiz GFP plasmid, Aldervon) was generated using SM102/PG-LipidFlex (40/60 mol%) formulation by PreciGenome NanoGenerator
- HepG2 and K562 Cell lines are successfully transfected by GFP DNA LNP. 48 hours post transfection, HepG2 Cell nucleuses are stained with Hoechst 33342 dye (blue color) before imaging

LipidFlex™ T Cell Kit

LipidFlex™ T cell kit is a highly efficient lipid formulation to synthesize mRNA lipid nanoparticles (LNP) for primary human T cell gene delivery. Using the NanoGenerator® Flex-S system and CHP-MIX-4 cartridge, customers can prepare potent mRNA LNPs in a convenient and efficient way.

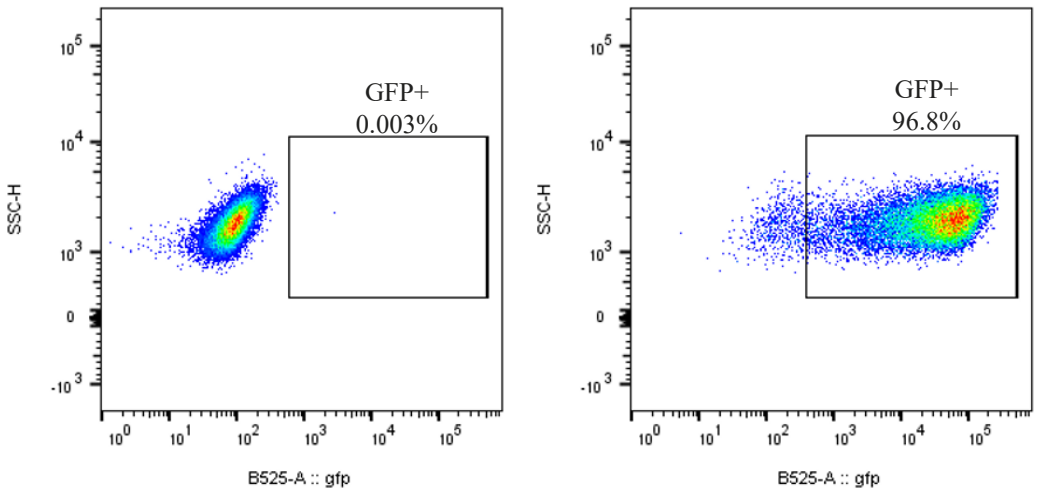


- Over 90% mRNA encapsulation efficiency
- High transfection efficiency
- High protein expression level
- High cell viability
- Time efficient synthesis process

Component	Size	Storage
LipidFlex T cell Lipid mix	125 µL	-80 ˚C
Formulation Buffer 1 (10x)	60 µL	4 - 8 ˚C
Formulation Buffer 2	600 µL	4 - 8 ˚C

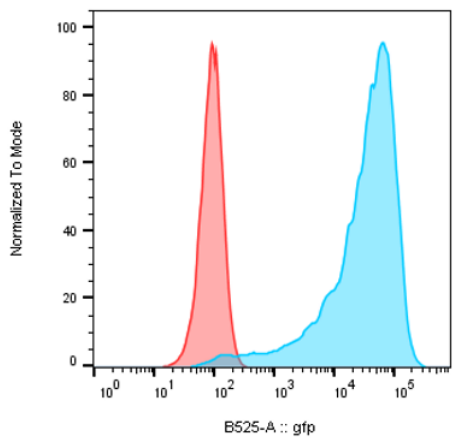
LipidFlex™ T Cell Kit

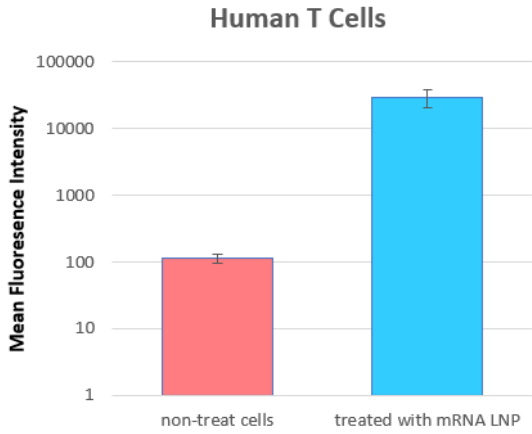
High Human T Cell Transfection Efficiency



* 24 hours post-treatment Human T cells (eGFP mRNA from Trilink)

High Protein Expression Level



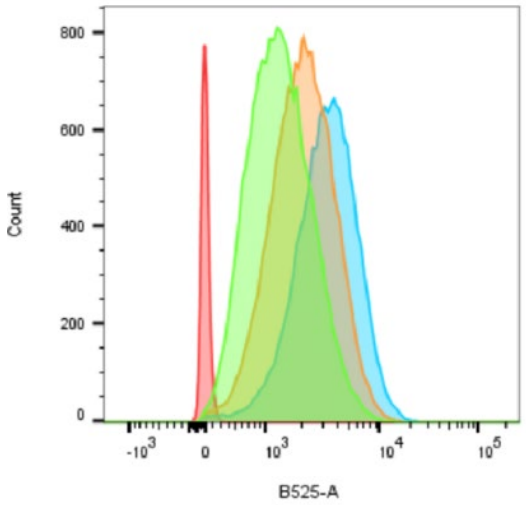


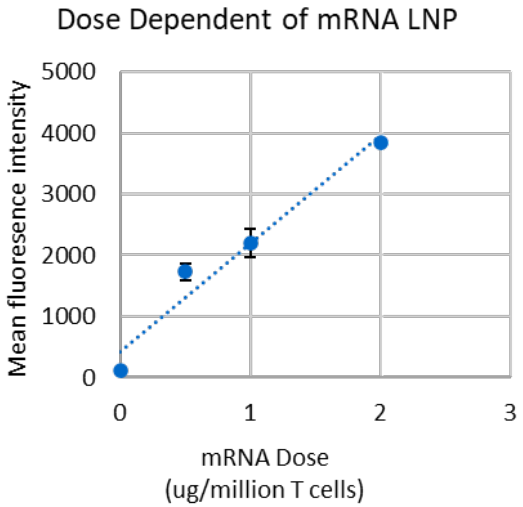
Non-treat cells Treated with eGFP mRNA LNP

* 24 hours post-treatment Human T cells (eGFP mRNA from Trilink)

LipidFlex™ T Cell Kit

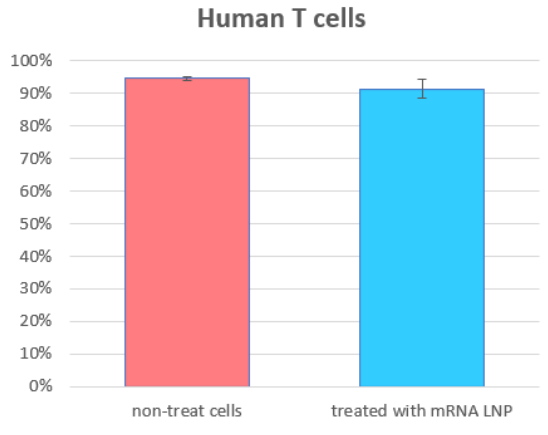
mRNA LNP Dose Dependency

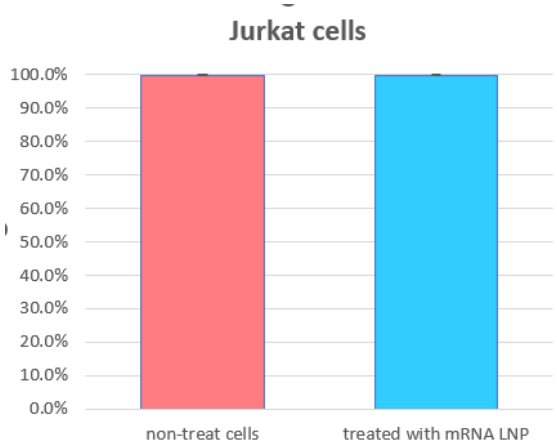




* 24 hours post-treatment Jurkat cells (eGFP mRNA from ProMab)

High Cell Viability





* 24 hours post-treatment Human T cells and Jurkat cells

Why PreciGenome?

High Performance & Efficiency

- Tunable size (40-200nm)
- Low PDI (0.05-0.2)
- High encapsulation efficiency

Open Platform

- Upgradable system
- Transferable microfluidic chips

Scalable Throughput

- Low volume for screening (Flex-S)
- Medium volume production (Flex-M/Flex-M Premium)
- High volume production (Pro, Max-GMP)

Simple Operation

- Simple setup
- Compact size
- Intuitive UI w/ touchscreen

Cost Effective

- Affordable configuration
- Lower cost per run

Custom Support

- Demo, Training and Support
- Extended Warranty
- Hot swap option
- Local US company

NanoGenerator® Flex-S

NanoGenerator® Flex-S Plus

NanoGenerator® Flex-M/Flex-M Premium

NanoGenerator® MAX Lite

NanoGenerator® MAX

Some of Our Customers

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