

nunchuck



UNCHAINED
LABS

Get sweet nunchuck skills

Nunchuck is the first and only platform that combines two key steps needed to make the perfectly-sized LNP – low-volume screening and scaled-up LNP formulation. Screen 8 total flow rates (TFRs) in just 10 minutes to find your sweet spot fast, then jump straight into making 0.250 mL to 1 L of your LNPs – all in the same day, on the same consumable. Dump the one-flow-rate-at-a-time, back-and-forth workflows for the ultimate one-and-done LNP maker.

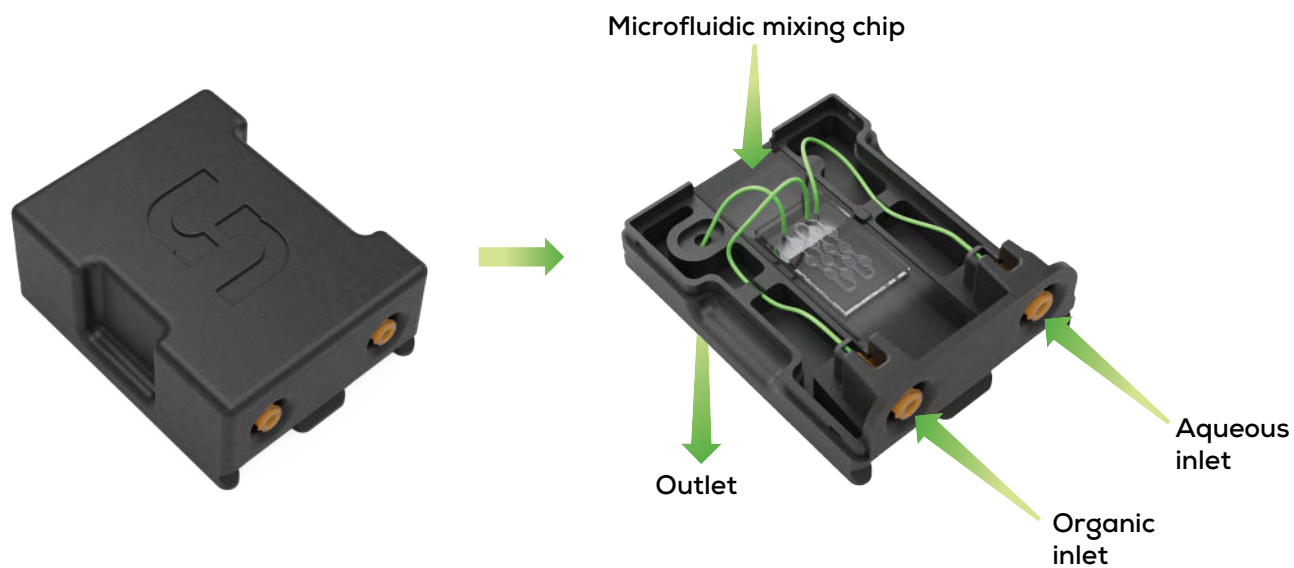
0.250 mL – 1 L formulations

Screen **8 TFRs** in **10 min**



The nun gets it done

Load your syringes filled with aqueous and organic solutions into Nunchuck, lock them into the Nun consumable, and you're ready to start making LNPs. The Nun's novel microfluidic mixing chambers can handle flow rates from 0.5 to 30 mL/min which means it can create a wide range of LNP sizes. Plus the nun can be used more than once – same day, same chemistry, same nun.



White belts welcome

Nunchuck is so easy to use a newbie can kick off a run in minutes. First, choose either a screening or prep run, then enter all the details about your formulation. The last step is to choose your flow rate ratio, total flow rates, and desired sample volume. You'll be an LNP black belt in 5 minutes flat.

UNCHAINED LABS ScreeningRun Nunchuck #6870

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Experimental Parameters

Enter desired total flow rate, pre and post-run waste volumes, flow rate ratio, and final volume.

Flow rate ratio		Calculated vol.
2	Aqueous syringe <i>Aqueous Formulation</i>	8.53 mL
to		
1	Organic syringe <i>Organic Formulation</i>	4.67 mL

Sample volume / TFR: 1.00 mL

Total flow rates	
1. Total flow rate	30.0 mL/min
2. Total flow rate	25.0 mL/min
3. Total flow rate	20.0 mL/min
4. Total flow rate	15.0 mL/min
5. Total flow rate	10.0 mL/min
6. Total flow rate	7.5 mL/min
7. Total flow rate	5.0 mL/min
8. Total flow rate	2.5 mL/min

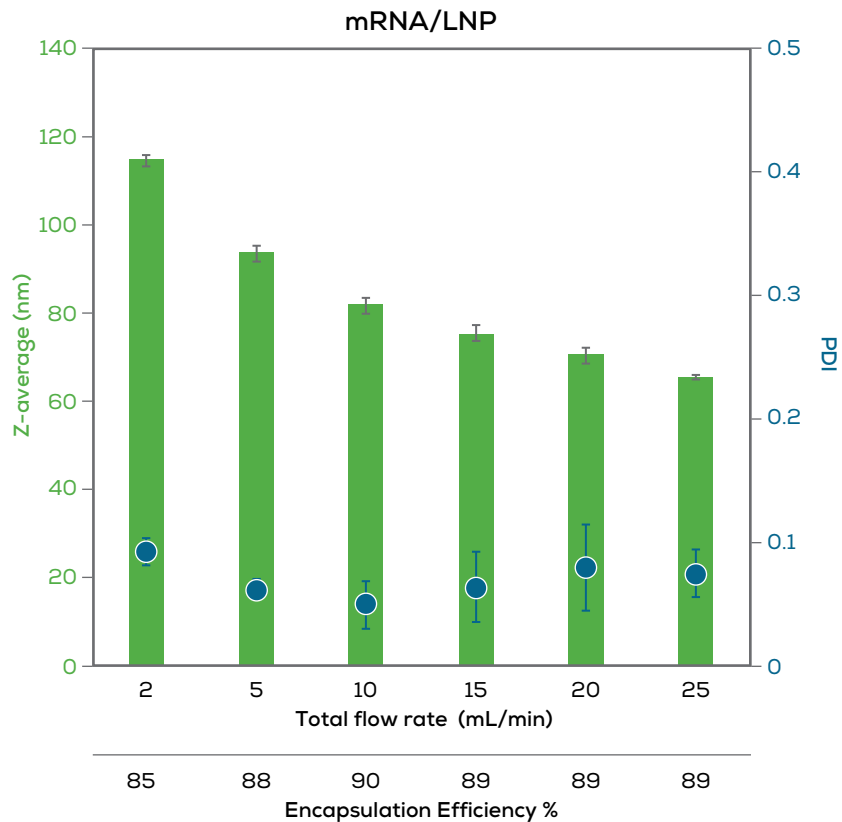
Pre-run waste: 0.35 mL
Aqueous waste: 0.12 mL
Organic waste: 0.23 mL

Post-run waste: 0.10 mL
Aqueous waste: 0.03 mL
Organic waste: 0.07 mL

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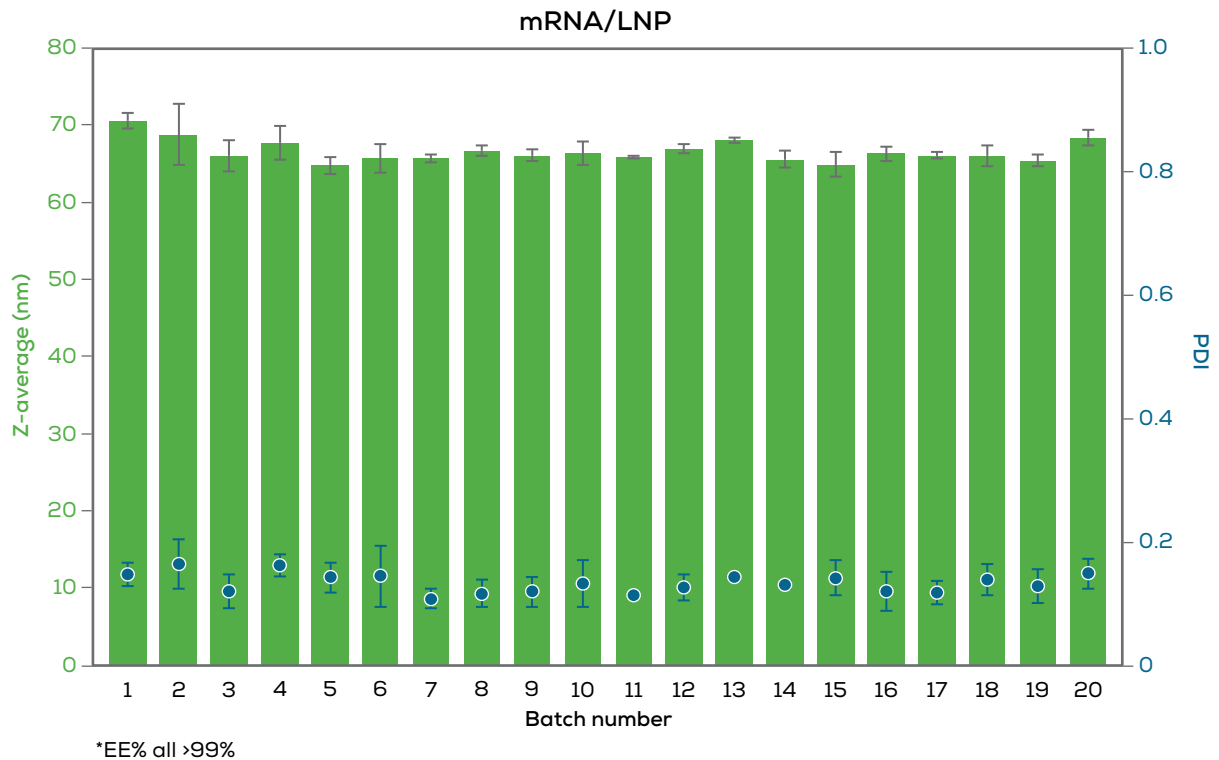
Hit your target

Depending on your target, you'll need to make different sizes of LNPs. Dialing in the total flow rate (TFR) is one of the most time-consuming steps for getting the size right. Nunchuck is outfitted with a fit-for-purpose screening run that nails down your TFR in 10 minutes. Screen up to 8 total flow rates with crazy repeatability so you can find your optimal conditions without breaking a sweat.



Level up

It doesn't matter if you need 0.250 mL to 1 L – Nunchuck gets you the same high-quality LNPs at any volume. Forget using one instrument to optimize your sample and another to make enough to characterize and develop your LNP formulations, Nunchuck always has your back.



Specifications

Application	
Prep run volume range	0.250 mL–1 L
Flow rate ratios (aqueous to organic formulations)	1:1 to 10:1
Total flow rates (TFRs)	0.5–30 mL/min
Full LNP size range	50–200 nm*
Target polydispersity index	≤0.2*
Encapsulation Efficiency percent (EE%)	≥85%*
Instrument	
Environmental conditions	Temperature range: 18–28 °C Humidity: 40–60% relative humidity (non-condensing)
Physical	Weight: 26 kg Dimensions: 49 cm L x 40 cm D x 27 cm H
Electrical	Voltage: 100–240 VAC, 2.5 A 50–60 Hz
Consumable	
Nun	Unchained Labs microfluidic mixing cartridge

* Sample and formulation dependent



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