

Nova Benchtop IJM System

Helix Biotech's new Nova Benchtop (BT) system is designed for lipid nanoparticle R&D and pre-clinical development – screen and optimize nanoparticle formulations quickly and with a versatile and scalable platform.

Best For: Research and Development and lab-scale production

Mixing Technology Options:

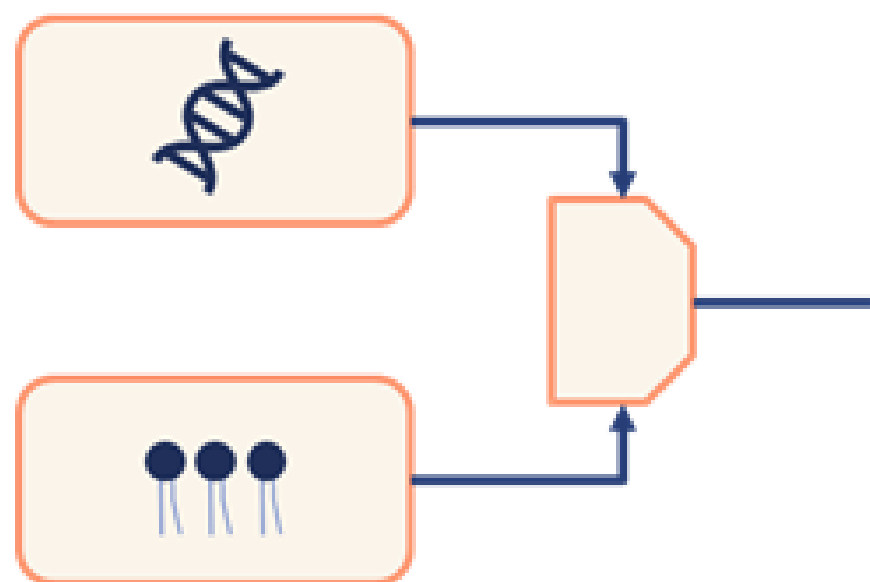
- Helix Impinged Jet Mixers (IJMs)
- Microfluidic (MF) chip compatible

Nova BT is a flexible modular platform for lipid nanoparticle synthesis. Researchers can choose from a range of IJM mixers or utilize common and custom microfluidic chips while screening lipid compositions and optimizing RNA+LNP formulation process parameters affecting encapsulation, particle size and polydispersity, and stability.

The NOVA platform is a modular system which means that scaling up is as easy as adding modules (pump and/or mixer modules). Simply add a pump module and second mixing stage to add in-line dilution or nanoparticle modification capabilities. For larger production capacity, blast through to the Nova Pilot High Throughput (HT) system.



NovaBT system with dual pump module and single-stage impinged jet mixer (Nova IJM)



Modules Components

- Pumps: Dual Pump Modules, Single Pump Modules
- Mixing Modules
- Sample Collection Modules

Software and Control

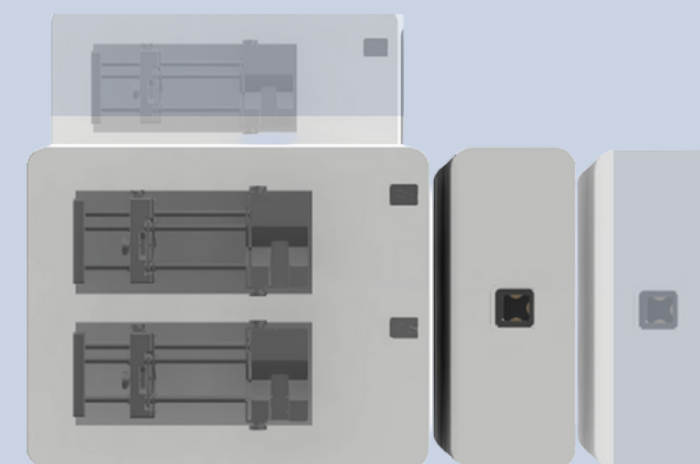
- Custom User Interface
- Monitor and control formulation remotely or in-person via PC or laptop.

Formulation Optimization - Common Easily Tunable Parameters

- TFR - Total Flow Rate
- FRR - Flow Rate Ratio
- Process Startup/End Wastes, Priming Volumes

Scaleup Studies: moving from $\leq 1\text{mL}$ to $\geq 100\text{mL}$

The default NOVA BT platform including a dual pump module, single-stage mixer, and sample collector can be used to prepare samples as small as 100uL while also enabling scaleup to $\geq 50\text{mL}$ per run. The system provides a repeatable manufacturing process, allowing pooling of multiple batches to produce $\geq 1\text{L}$ of material. All Nova BT processes and mixing technologies are designed to facilitate seamless tech transfer and process scaleup with SuperNova High Throughput (HT) systems .



NovaBT system with optional modular components

Specifications

Nova Benchtop (BT)	
Pump Type	Syringe pump modules
Mixer Type	*Nova IJM, Size 1-3
Number of IJM Mixers	Default: 1 (additional modules optional)
Number of pumps	2+ (+in-line dilution and additional modules optional)
Number of flow meters	N/A
Pump Syringes	1-60 mL syringes
Pump Flow Rate	0.1-100 mL/min (based on syringe size)
Total Flow Rate	2 pumps: 0.2-200 mL/min
Wetted Materials	PEEK, Syringe material (PP, glass)
Liquid Temperature Range	4-65 °C (39-150 °F)
Software	Laptop/PC Based Control Software
Interfaces	Pump: Serial (USB/RS-232) Sample Collector: Serial (USB/RS-232)
Power Supply	100-240 V, 50-60 Hz
Power Consumption	Pump: 40W Sampler: 20W
Dimensions	Dual Pump module: 14.5" x 11.5" x 6.75" Mixing module: 4.5" x 11.5" x 6.75" Sample collection module: 5.5" x 9.5" x 6.75"
Weight	Dual Pump module: 13 lbs. Mixing module: 8 lbs. Sample collection module: 11 lbs.
In-line API dilution and Quenching	Yes (with additional pump and mixing modules)
Factory Acceptance Testing	YES