



The NanoAssemblr™ Benchtop

Develop novel nanomedicines faster using precise formulation conditions

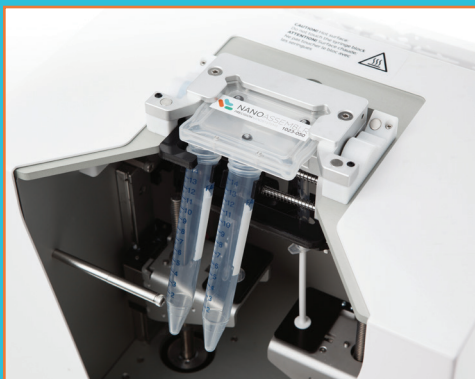
Precision NanoSystems' NanoAssemblr Benchtop system is designed for rapid prototyping of novel nanoparticles, that would be difficult to make with alternative manufacturing methods.

The system uses proprietary microfluidics for the quick and precise mixing of nanoparticle components. Users can tune size (~20 to 120+nm) by changing process and composition – tweaking parameters such as mixing ratios and flow rate to achieve desired and repeatable results.

The system is fast, enabling 30+ formulations in a day and is easy-to-use. Software controlled mixing assures repeatable and precise results.

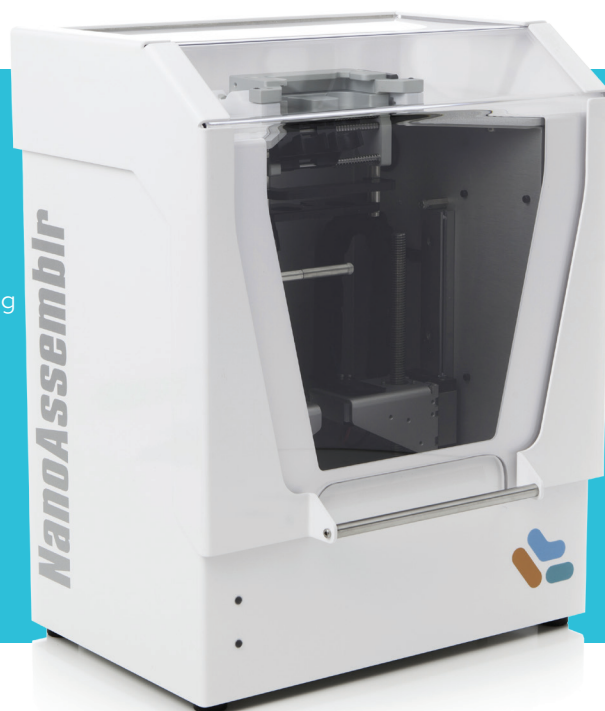
Precise protocols recorded by the software allow for the transfer of manufacturing conditions between sites and users, which accelerates development, reduces waste and ultimately saves time.

Accelerate your research and nanomedicine development. Produce nanoparticles in one minute on a standard system and move the discovery and development of your formulations ahead more easily than ever before.

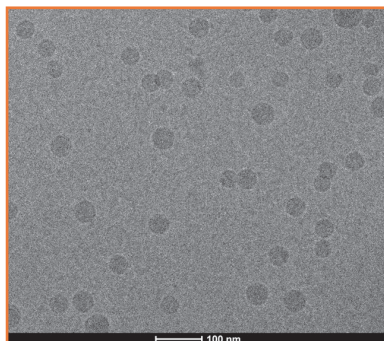


Applications and types of formulations Include:

- Protein delivery and screening
- Nucleic acid delivery and screening
- Nanoparticle design
- Targeted drug delivery
- Lipid nanoparticles
- Liposomes
- Polymeric nanoparticles

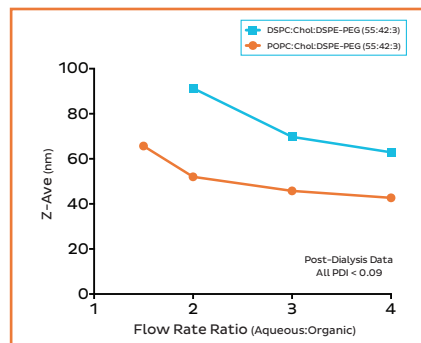


Monodisperse Lipid Nanoparticles



Cryo-TEM micrograph of siRNA LNP
PDI < 0.09

Dictating Size by Process and Composition



“Limit size” Liposomes are dictated by the Flow Rate Ratio

NanoAssemblr Microfluidic Cartridge

Precision control of the chemical and physical environment is required for nanoparticle self-assembly. PNI's highly engineered cartridges provide the perfect solution for formulation development.

Benefits of the Microfluidic Cartridge include:

- Isolated fluid path prevents cross-contamination
- Laminar flow and time-invariant mixing
- Rapid mixing (<3 ms)
- Nanoliter reaction volumes (<20 nL)
- <2 min per formulation, 30+ formulations per day



To find out more or to schedule a demo of the benchtop instrument, visit www.precisionnanosystems.com.

System Specifications

Dimensions (width x depth x height)		31 x 23 x 38 cm (12"x9"x15")
Flow Rates		2 to 12 mL/min
Temperature Control		20 – 70 °C (with heating block)
Syringe Compatibility		1, 3, 5, 10 mL BD Luer-Lok™ or Slip-Tip Disposable Syringes
Max Volume per Run		15 mL
Min Recommended Volume per Run		1 mL
Fluid Mixing Time		<3 ms
Fluid Mixing Properties		Laminar
Waste and Sample Collection		15 mL Falcon Conical Tubes
Electrical	Instrument	100 – 240 VAC, 1.2 A (Max.)
	Heating Controller (accessory)	100 – 240 VAC, 0.58 A (Max.)

Accessories

Name	Description
Heating block accessory	The block is used to heat precursor solutions prior to injection into the instrument.
Heating controller package	Heating block temperatures can be set up to 75°C using the digital temperature controller.
Cartridge (5 pack)	The cartridge uses microfluidic channels to enable the self-assembly of components into nanoparticles.

Microfluidic Mixing: A General Method for Encapsulating Macromolecules in Lipid Nanoparticle Systems

Alex K. K. Leung, Yuen Yi C. Tam, Sam Chen, Ismail M. Hafez, and Pieter R. Cullis J. Phys. Chem. B, 2015, 119 (28), pp 8698–8706. DOI: 10.1021/acs.jpcb.5b02891

Microfluidic-Controlled Manufacture of Liposomes for the Solubilisation of a Poorly Water Soluble Drug. Elisabeth Kastner, Varun Verma, Deborah Lowry, Yvonne Perrie. International Journal of Pharmaceutics, Volume 485, Issues 1–2, 15 May 2015, Pages 122–130. DOI:10.1016/j.ijpharm.2014.10.030

Bottom-Up Design and Synthesis of Limit Size Lipid Nanoparticle Systems with Aqueous and Triglyceride Cores Using Millisecond Microfluidic Mixing. Igor V. Zhigaltsev, Nathan Belliveau, Ismail Hafez, Alex K. K. Leung, Jens Huft, Carl Hansen, Pieter R. Cullis. Langmuir, 2012, 28 (7), pp 3633–3640. DOI: 10.1021/la204833h

About Precision NanoSystems, Inc.

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 provides instruments, reagents and services to life sciences researchers, including pharmaceutical companies, and builds strategic collaborations to revolutionize healthcare through nanotechnology.

