NanoAssemblr® Benchtop
Develop Future Nanomedicines
Develop the Future of Medicine

Overcome key challenges in advancing nanomedicines:

<table>
<thead>
<tr>
<th>Challenges with conventional production methods</th>
<th>Solutions with the NanoAssemblr™ Benchtop</th>
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</thead>
<tbody>
<tr>
<td>Inconsistent Results</td>
<td>Reproducibility</td>
</tr>
<tr>
<td>Leads to poor quality particles, and unreliable data</td>
<td>Computer control removes batch-to-batch and user variability</td>
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<tr>
<td>Inability to Control Size</td>
<td>Controlled Assembly</td>
</tr>
<tr>
<td>Materials dictate size, making comparisons of activity between materials difficult</td>
<td>Tune particle size with identical composition using precise control of fluid flow rates</td>
</tr>
<tr>
<td>Costly Scaling Redevelopment</td>
<td>Scalability</td>
</tr>
<tr>
<td>Changing scale of formulations affects their properties, requiring expensive, time consuming process redevelopment</td>
<td>Easily scale formulations up to 15 mL. Conserved microfluidic geometry allows direct scale-up to the Blaze™ and 8x Scale-Up systems</td>
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<tr>
<td>Limited Productivity</td>
<td>Speed and Efficiency</td>
</tr>
<tr>
<td>Long, complex processes lengthens the production time of formulations, and increase the risk of process error or failure</td>
<td>Formulation runs require less than a minute. 30 - 40 formulations can be completed in a day for rapid optimization</td>
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<tr>
<td>Process Requires Expertise</td>
<td>Intuitive Work Flow</td>
</tr>
<tr>
<td>Projects require numerous experienced specialists, long training periods, and carry significant risk with staff turnover</td>
<td>Advanced microfluidics are simplified with an intuitive software interface and no complex fluidic connections</td>
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</tbody>
</table>

The NanoAssemblr platform is trusted by over 200 biopharmaceutical companies and research institutes
Accelerate Nanomedicine Development

The NanoAssembler Benchtop is ideal for nanomedicine formulation development and optimization.

**Exceptional Versatility**

The NanoAssembler Benchtop has been used to advance the development of a wide variety of nanomedicines encapsulating diverse active materials.

<table>
<thead>
<tr>
<th>PARTICLE TYPE</th>
<th>ACTIVE INGREDIENT</th>
<th>EXAMPLE APPLICATION</th>
<th>CARRIER MATERIALS</th>
</tr>
</thead>
</table>
| Nucleic acid Lipid Nanoparticles (LNP) | - Nucleic Acids | - Rare genetic diseases  
- mRNA protein replacement  
- mRNA vaccines  
- Gene and cell therapy | - Ionizable lipids  
- Phospholipids  
- Cholesterol  
- PEG-Lipids |
| Liposomes              | - Lipid Nanoparticles (LNP) | - Vaccine adjuvants  
- Antimicrobials  
- Cancer chemotherapy  
- Diabetes combination therapy | - Phospholipids  
- Cholesterol  
- PEG-Lipids |
| Polymer NPs            | - Peptides and Proteins    | - Cancer chemotherapy  
- Targeted protein delivery  
- Controlled release/ biodistribution  
- Immuno-oncology | - Poly-lactides (ex: PLGA)  
- Block copolymers (ex: PEG-b-PLGA)  
- Polysaccharides (ex: chitosan, cellulose) |
| Emulsions              | - Small Molecules          | - Cancer chemotherapy  
- Drug formulation  
- Controlled release/ biodistribution | - Triolein/POPC  
- Oil/Surfactant |
| Organic/Inorganic NPs  | - Imaging Contrast Agents  | - Theranostics  
- Imaging | - Lipids  
- Noble metal NPs  
- Rare Earth Metals  
- III-V semiconductors |
**Versatile, Reproducible, and Scalable Formulation**

**Optimize liposomal drug delivery systems**

Easily tune liposome size by changing Total Flow Rate (TFR) and Flow Rate Ratio (FRR).

**Develop polymeric drug delivery systems**

Easily tune size by changing Total Flow Rate (TFR). Control polymer nanoparticle size with instrument parameters.

Control block-copolymer micelle size with instrument parameters.

**Advance genetic medicine formulations**

Optimize lipid nanoparticles (LNPs) for encapsulation and delivery of diverse nucleic acid therapeutics.
Targeted Therapy
Dan Peer’s lab at Tel Aviv University have developed antibody-targeted nanoparticles for delivery of RNA to specific immune cells following systemic administration.

Dual drug-loaded liposomes for combination therapy
Yvonne Perrie’s lab at Strathclyde University have demonstrated simultaneous liposome formation and loading with 2 small molecules. This dramatically reduces complexity of liposome production, while allowing combination therapies.

mRNA Vaccines
Moderna Therapeutics are revolutionizing vaccine development. Delivering mRNA instead of live or attenuated viruses reduces vaccine development time potentially allowing rapid response to new or changing pandemics.

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Controlling Biodistribution
Shyhdar Li’s lab at the University of British Columbia demonstrated size dependent control over the biodistribution of a drug-conjugated polymer nanoparticle. They observed differences in the biodistribution of 20nm and 30nm diameter particles.

CRISPR/Cas9 gene editing
Intellia Therapeutics have developed a biodegradable nanoparticle to deliver CRISPR/Cas9 gene-editing components that achieved 97% target protein knockdown for at least 12 months with a single treatment in animal models.
# Ordering Information

<table>
<thead>
<tr>
<th>NAME</th>
<th>PRODUCT CODE</th>
<th>INCLUDES</th>
</tr>
</thead>
<tbody>
<tr>
<td>NanoAssemblr™ Benchtop Instrument Cartridge Bundle</td>
<td>NIT0055</td>
<td>1  NanoAssemblr Benchtop</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1  Power supply (worldwide)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1  NanoAssemblr Control Laptop</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50  NanoAssemblr Benchtop Cartridges</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1  1 year warranty</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1  Installation and initial training</td>
</tr>
<tr>
<td>NA BT Heating Controller Package - 3 and 1 mL*</td>
<td>NIT0026</td>
<td>1  Heating Block (3 and 1 mL)*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1  Heating Controller</td>
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</tbody>
</table>

*Other configurations for different combinations of syringe sizes also available

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

Or to learn more about the NanoAssemblr Platform, visit precisionnanosystems.com/systems

## 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.