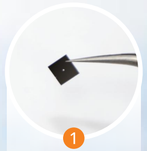
NanoCoulter™

World's first nanopore chip for RPS



1 Silicon-based nanopore N-Chip™

2 Assemble the N-Chip™ into the chip cartridge

3 Pipette the sample into the loading chamber

True Particle-by-particle Detection
Precise analysis of polydisperse or heterogeneous samples as each particle passes through the nano-aperture.

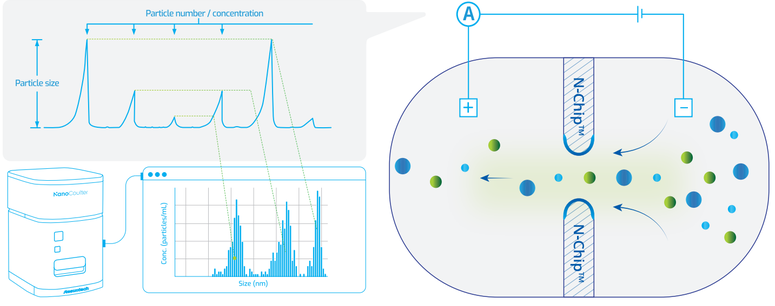
True-to-sample Results
Unaffected by optical properties of particles, delivering non-fitted, highly accurate data reflecting the true state of samples.

HD
High Resolution and Sensitivity
1 nm particle size resolution for high-precision applications—comparable to TEM.

Superior Accuracy and Precision
Highly linear concentration measurements (R^2 > 0.999) and consistently low CV% across all tests.

Resistive Pulse Sensing (RPS) Principle

NanoCoulter™ utilizes the resistive pulse sensing (RPS) principle, also known as the Coulter principle. When the voltage is applied in the electrolyte, as individual particles traverse the nano-aperture of the NanoCoulter™ N-Chip™, a transient change in electrical resistance is generated, forming a resistive pulse. These resistive pulses are accurately analyzed by NanoCoulter™ to yield multi-dimensional data, including particle size, concentration, and Zeta potential.



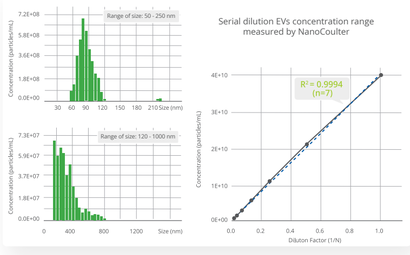
APPLICATIONS

Extracellular Vesicles (EVs)

RPS measurements do have very high concordance with TEM data.

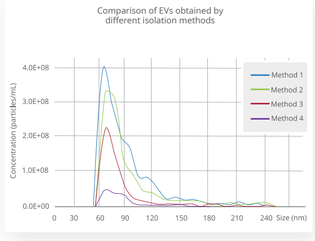
MISEV 2023

RPS technology, a non-optical method, well suited for orthogonal validating against TEM and flow cytometry. NanoCoulter™ offers accurate size distribution analysis with a defined LOD (50nm) and a wide concentration range (5×10^7-2×10^{11} particles/mL), making it indispensable for EV research.*



Investigation of EV Isolation Methods

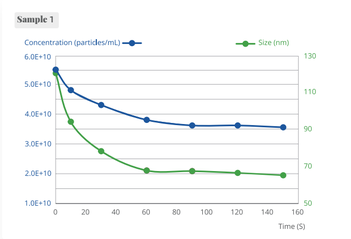
Exosomes have complex origins and often require multiple isolation steps to obtain relatively pure exosomes. Different isolation methods can significant impact on the particle size and concentration of exosomes. The NanoCoulter™ enables rapid and accurate assessment of the advantages and disadvantages of different purification methods.

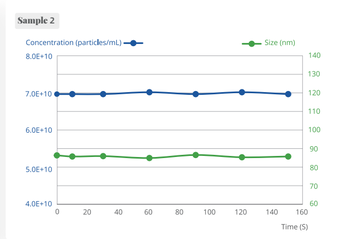


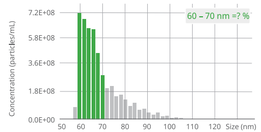
Liposome/LNP

Liposome Stability Study

The stability of liposomal drugs directly affects their storage and in vivo delivery performance. The NanoCoulter™ enables precise evaluation of stability differences among various liposomes. The figure below shows the concentration changes of two liposome samples after different durations of simulated agitation, indicating that Sample 2 exhibits superior stability.





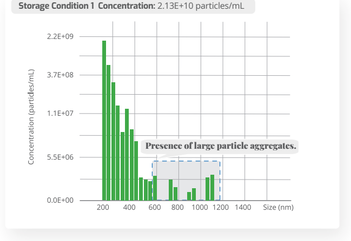


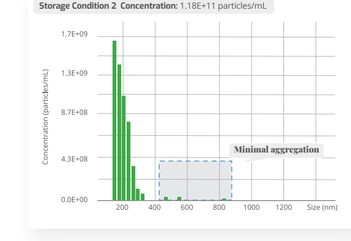
Sample	60 nm – 70 nm		
	Size	Conc.	%
1#	64	3.4E+13	61.2%
2#	63	3.0E+13	59.5%

VLPs

Poxvirus Particles Aggregation Analysis

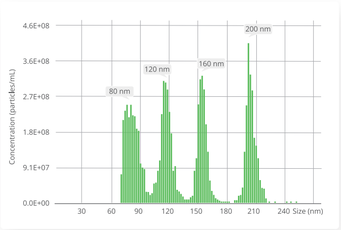
The storage conditions of viruses have a significant impact on their degree of aggregation. Excessive aggregation can reduce the infectivity of the virus. The NanoCoulter™ possesses extremely high particle size resolution and is the only technology besides electron microscopy capable of accurately analyzing virus aggregation. In the distribution plots of poxvirus particles under two different storage conditions shown below, the virus particles under Condition 2 exhibit significantly better dispersion.



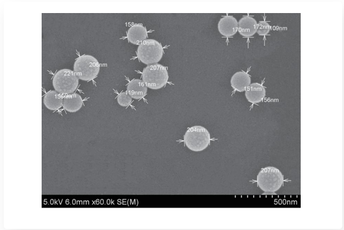


Electron Microscopy- Comparable Particle Size Determination

NanoCoulter™ measures both the particle size and size distribution of polydisperse samples, delivering EM-consistent results with exceptional accuracy and precision.



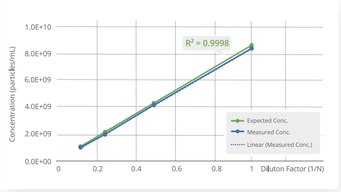
Particle Size Data Measured by NanoCoulter™



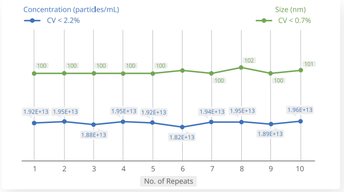
Electron microscopy results for the same sample

Measure Concentration with High Accuracy and Repeatability

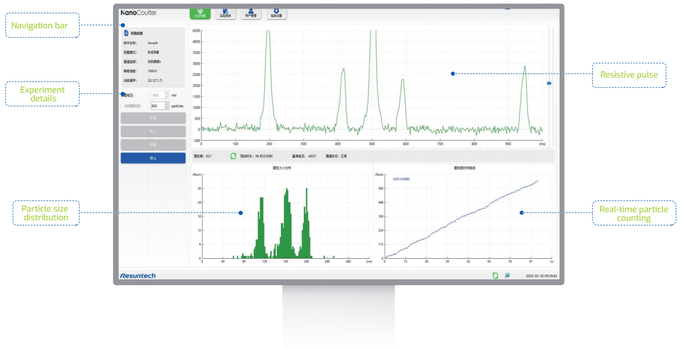
Samples were serially diluted, and the concentration detection data demonstrated a strong linear correlation with the theoretical concentration (R^2 > 0.999). Across 10 repeated measurements, the coefficient of variation (CV) was less than 5%.



Linearity of concentration



10 Replicate Measurements of a 100 nm Standard Sample



NanoCoulter™ Particle Analyzer		Technical Specifications
Model		NanoCoulter Scale
Principle		Resistive Pulse Sensing (RPS)
Channel		Single-channel
Particle Size	Range	50 - 300 nm
	Accuracy	100% ± 6%
	Precision	CV < 3%
Concentration	Range	1 × 10^7 - 3× 10^{11} particles/mL
	Accuracy	100% ± 10%
	Precision	CV < 5%
Testing Time Per Sample		2-3 (up to 15) min
Volume Per Sample		200 µL after dilution
Operating System		Windows 7+ Pro/Ent
GMP/GLP Management		IQ/OQ Option/FDA 21 CFR Part 11 Option
Dimensions (W x D x H)		28.5 cm x 35 cm x 45 cm
Weight		17.3 kg

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NanoCoulter™ Scale

Single-Nanoparticle Characterization Expert

TEM-Comparable
Resistive Pulse Sensing Technology

Resuntech®
瑞芯智造

High Precision
High Sensitivity
High Resolution