

# Spectradyne's Nanoparticle Analyzer Technology

## A Modern Implementation of Proven Technology

Spectradyne's nCS1™ instrument (Fig.1) Resistive Pulse Sensing (MRPS, a.k.a. the Coulter Principle), a proven technique that is considered the gold standard for whole blood measurements. The RPS technique has been updated using Spectradyne's patented nanoparticle analyzer (NPA) technology. The heart of the technology is electrical detection of nanoparticles as they pass one by one through a nanoconstriction.



Figure 1: The Spectradyne nCS1 occupies a small benchtop footprint, prevents contamination between measurements and eliminates cleaning requirements.

## 7KH Q&6 'L•HUHQFH

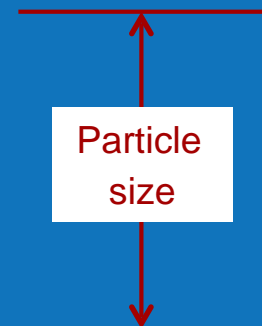
- No dependence on particle material type
- High-resolution size distribution
- Sizing range: 50nm to 2µm diameter
- Arbitrary polydispersity
- Total sample analysis in minutes.
- 'LVSRVDEOH PLFUR5XLGLF FDUWULGJH )
- Only 3µL sample required
- Truly orthogonal to light-based techniques

- Nanomedicines
- Biologics: protein aggregates, viruses, etc.
- Drug ingredients: excipients, carriers, lipids, etc.
- General nanoparticles: gold/silver, silicon-derived, metal-oxide nanoparticles, etc.

- Nanoscale constriction (NC)
- Electrical detection
- Individual particles



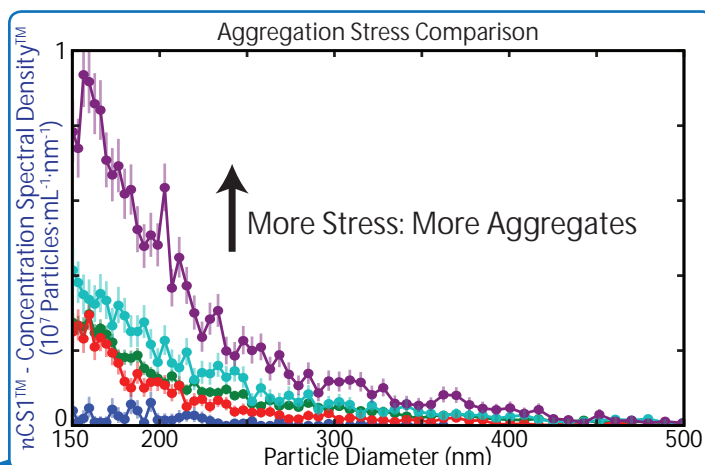
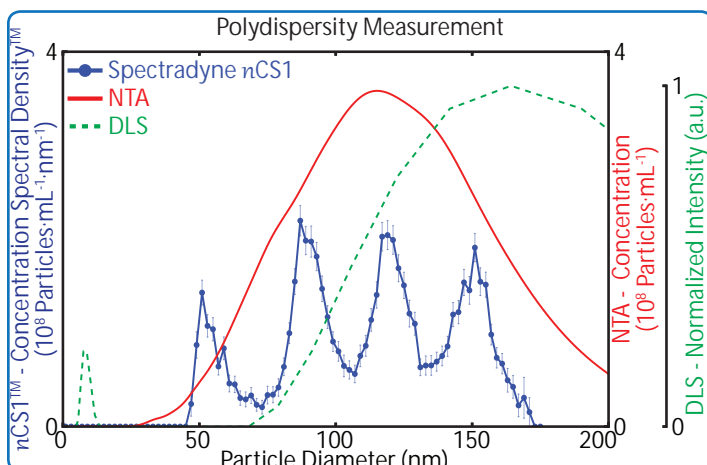
- Passage through NC generates signal
- Signal scales with particle size



0 Time (µs) 100

+RZ 0LFUR5XLGLF 5HVLVWLYH 3XOVH 6HQVLQJ 0536 ZRUNV 3DUWULFOHV  
constriction (NC) as shown on left side. A voltage drop is applied continuously across the two sides of the NC. As particles pass through the NC, the output signal changes in proportion to the volume of the particle. Particles are measured individually, with no dependence on particle material.

## Example nCS1 Applications



In the graph above, results are shown for an equal parts mixture of polystyrene beads having 1–67 and 150nm measured with the nCS1, and also by an independent laboratory using DLS and nanotracking analysis (NTA).

Only the nCS1 has high enough resolution to clearly resolve the four components of the mixture, and properly return concentrations for each within

In the example shown above, protein aggregates in a proprietary protein formulation were accurately provided: one unstressed sample and four samples subjected to increasing levels of stress (10, 20, 30 and 60 minutes of stress). The sample was run “as-is”: no dilution or additives were required.

The nCS1 was able to clearly show increased aggregation with increased stress. Protein since they rely on optical contrast, which is very low in this type of sample.

Contact Spectradyne today and ask for a complimentary sample analysis:  
Spectradyne LLC, 23875 Madison St., Suite A, Torrance, CA 90505  
(424) 271-9262 [www.nanoparticleanalyzer.com](http://www.nanoparticleanalyzer.com)

### Spectradyne nCS1 Specifications

Technology	0LFUR5XLGLF 5HVLVWLYH 3XOVH 6HQVLQJ
Acceptable particle types	All materials (e.g. transparent/opaque, conducting/insulating, etc.)
Particle Size Range	40nm to 2,000nm
Sizing/Concentration Precision	Sizing < ±3%, Concentration < ±10% (particles/ml)
Measurable Concentration Range	= WR {t SDUWLFOHV PO VDP SOH GHSHQGHC
Sample Size Required	% /
Maximum Particle Detection Rate	/ SDUWLFOHV VHF VDP SOH GHSHQGHQW
Instrument Control Interface	USB to Windows computer
Data Analysis Software	Proprietary signal extraction method, real-time signal display, UHDO WLPH FRQFHQWUDWLRQ GLVSOD\ PXOW
Physical Characteristics	13" W x 15" L (33 cm W x 38 cm L)
Electrical	Standard 120/220V, 50/60 Hz AC