STUNNER

UNCHAINED LABS

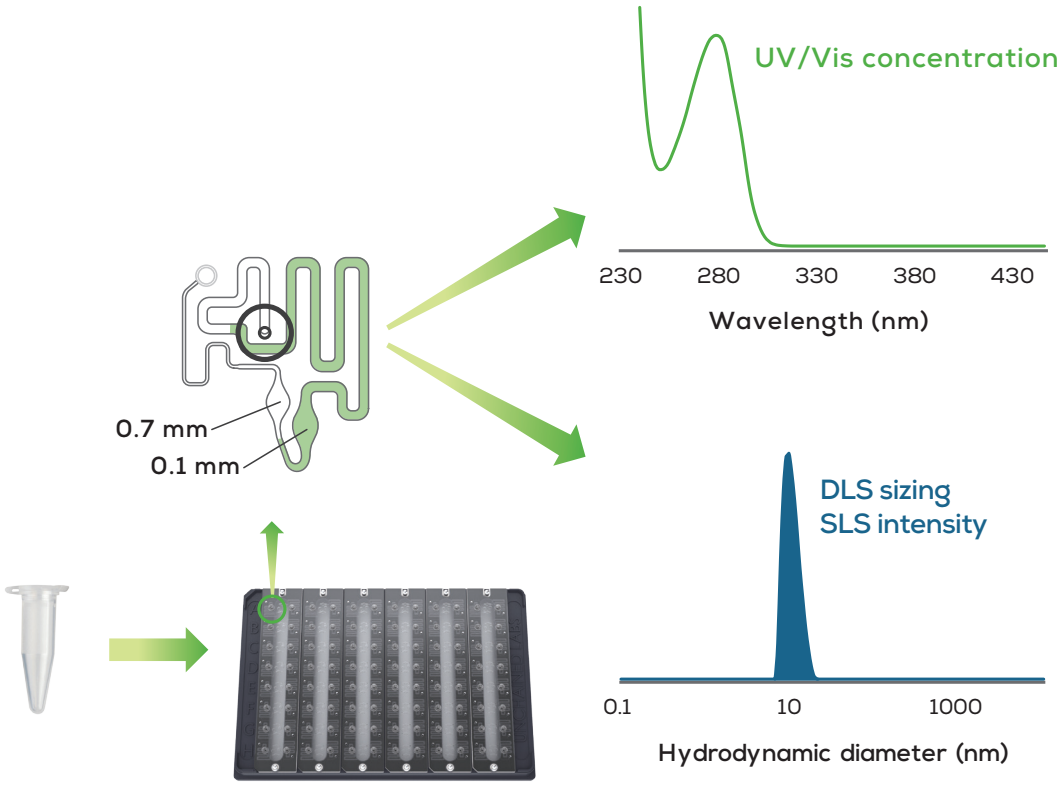
Combine and conquer

Stunner is the only system that pulls together UV/Vis concentration, dynamic light scattering (DLS) and static light scattering (SLS) data from the same 2 µL sample. Dig in to your AAV to get the total capsid titer and empty/full ratio, or rack up payload concentration and size data on any nanoparticle all at once. Nail down your protein quality by knocking concentration, hydrodynamic size, polydispersity, and detection of aggregates off your list in one shot. Without skipping a beat, you'll know if your AAV, nanoparticle or protein is good to go.

- AAV capsid titer
- AAV empty/full ratio
- LNP total RNA quant
- Nanoparticle payload quant
- Aggregation
- Concentration
- Sizing & polydispersity
- B_{22} & k_D

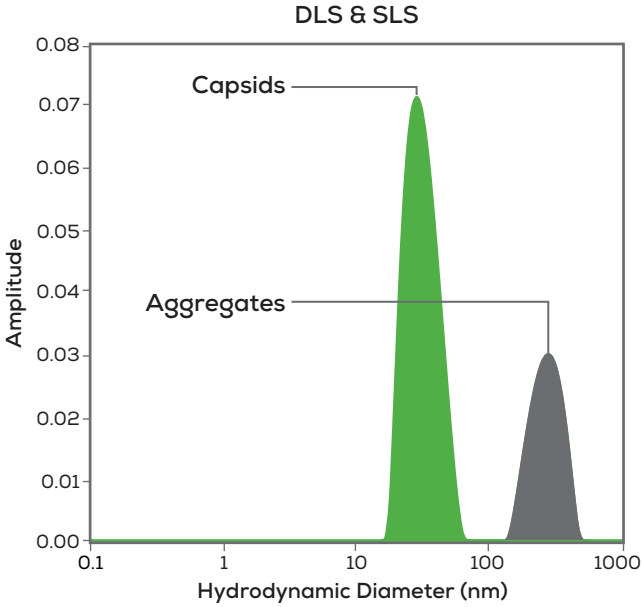
Teeny sample, tons of info

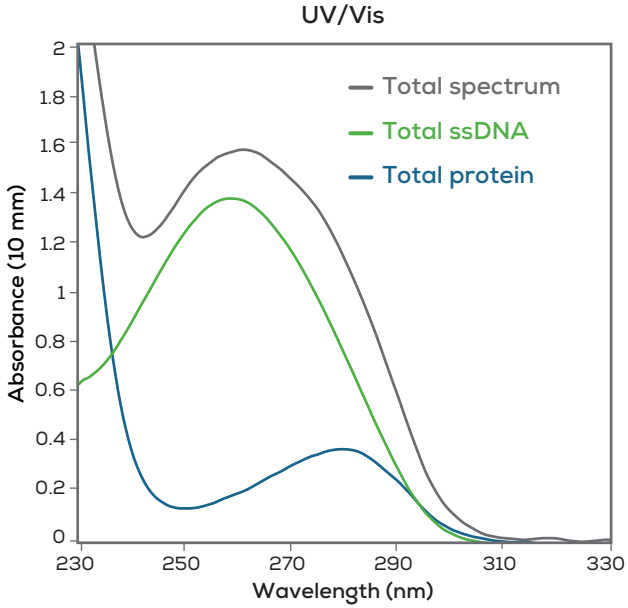
Just load 2 µL of sample in a Stunner plate – don't bother with sample prep or dilution. Each microfluidic circuit has two fixed pathlengths built into it to cover a wide dynamic range of 0.03-275 OD. If you're dealing with a full plate, get 96 concentration measurements in 10 minutes – add on DLS sizing and have both done in an hour. For even heavier workflows, hook it up to your favorite robot to add more oomph.



Look your AAV up and down

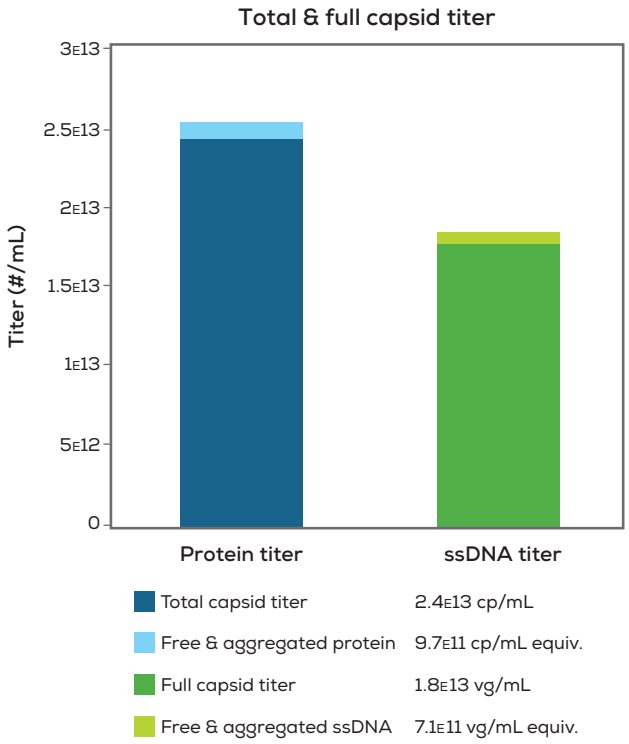
Drop in your AAV and before you can blink, DLS & SLS figure out how many intact capsids you have or if a bunch of aggregates are screwing things up. See empty/full ratio, total protein and total ssDNA in about a minute with UV/Vis. Don't worry about extinction coefficients or overlapping spectra – Stunner does all the math for you.

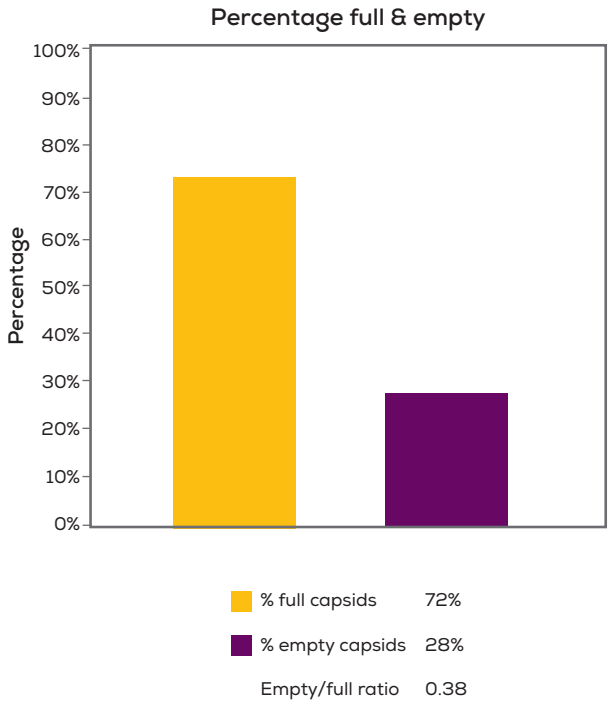




Know your AAV inside out

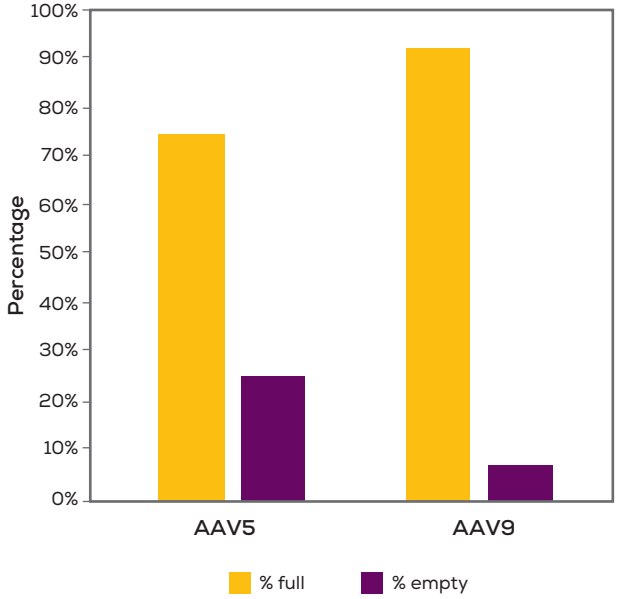
Get to the numbers you actually want - titers. Stunner bridges DLS and UV/Vis data to tally up how many full and empty capsids are present, and how much extra protein and DNA is left over. Take your cleaned up AAV and sneak a peek down to 10^{12} vg/mL. In just one assay, Stunner's dye-free, label-free, standard-free, hassle-free workflow tells the whole titer story.





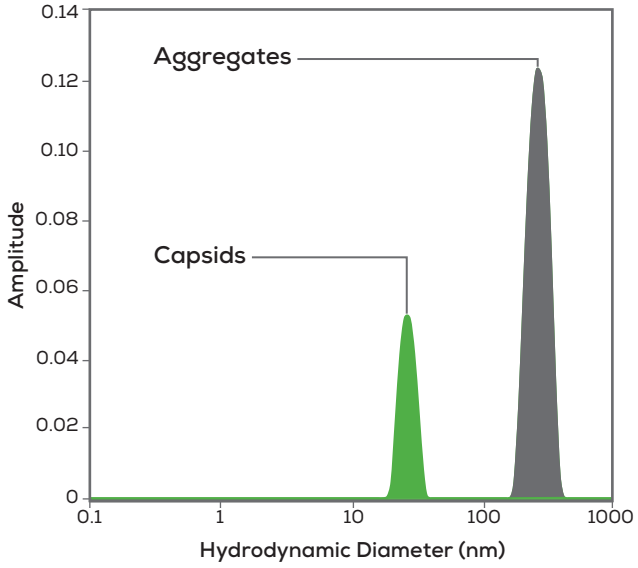
Titer for any serotype

Every AAV is different, but Stunner figures them all out. Pick a preloaded serotype or feed in the specs for your virus and get answers in seconds. Now you can check capsid titers and empty/full ratio as often as you want.



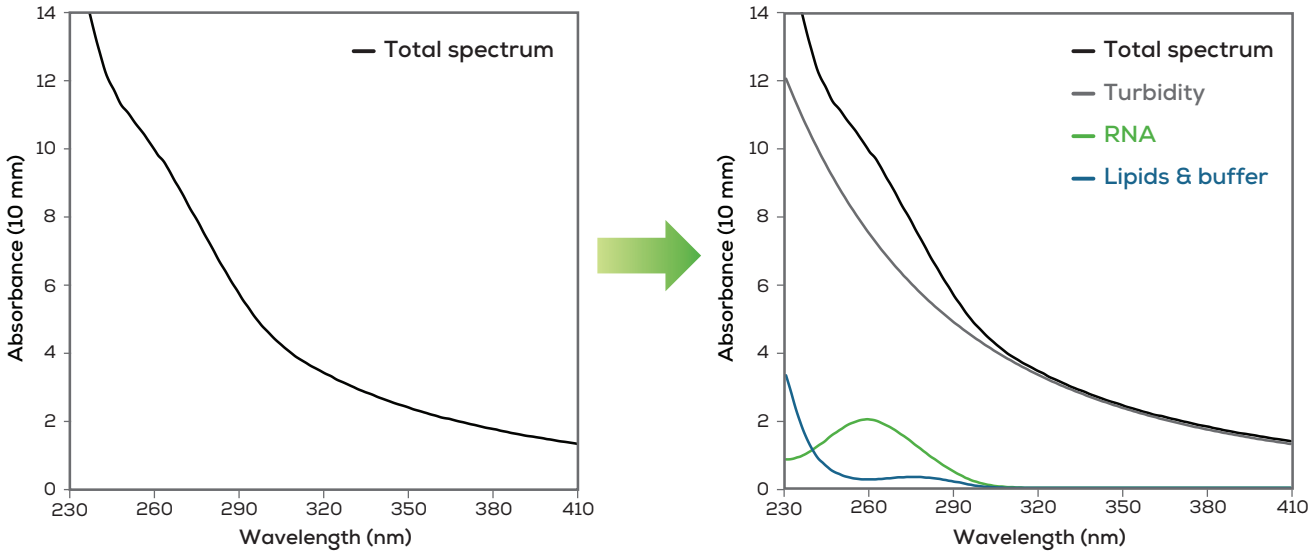
Aggregates ruin everything

Globs of AAV can stand between you and high-quality data for pretty much every assay. DLS checks if your AAV is monodisperse so the rest of your process doesn't get tripped up by aggregates.



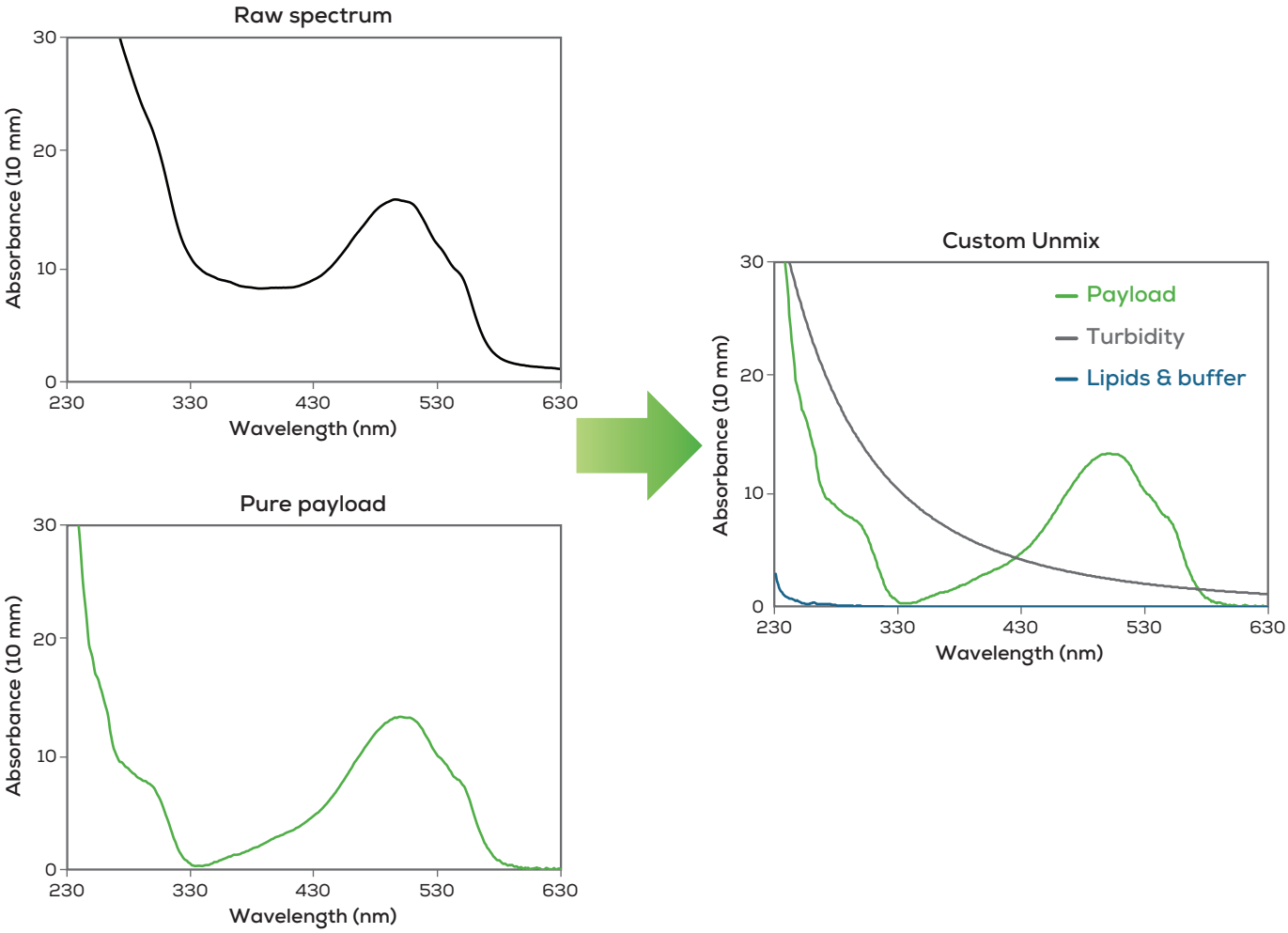
See through the fog

Cloudy solutions of LNPs and other nanoparticles hang up other techniques but Stunner's short pathlengths teamed up with DLS and UV/Vis get you the answers you need. Cut through all that turbidity with Unmix and check out just the absorbance signal from your payload.



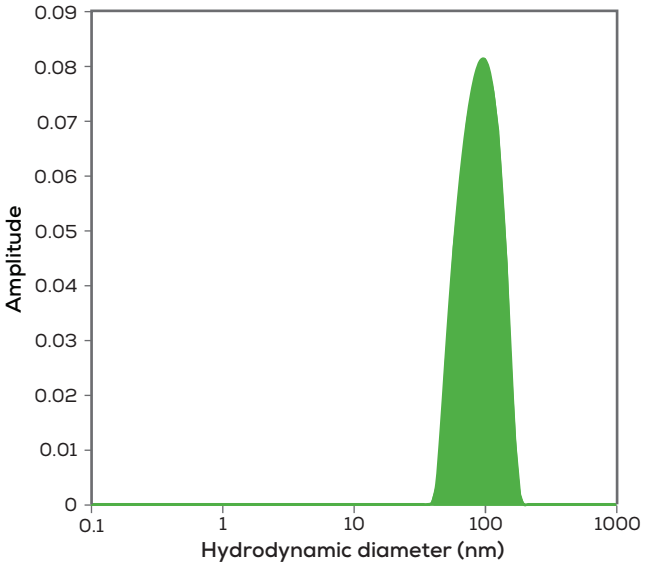
Break down data, not your particles

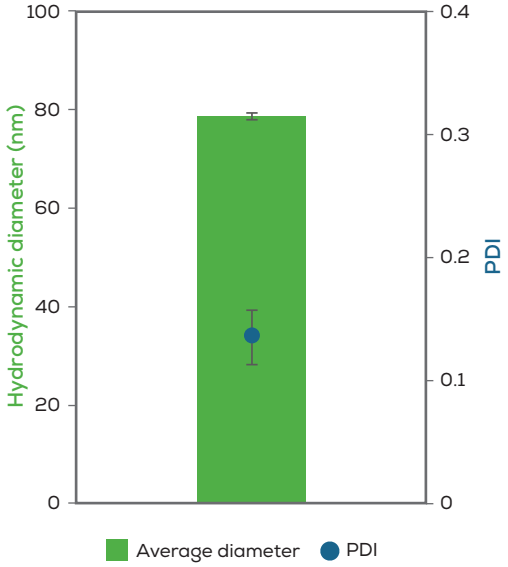
Teach Stunner all about the UV/Vis absorbance of your nanoparticle and it will spot exactly the signal you want to know about. Skip the disruption step and quantify any payload: RNA, DNA, any protein or whatever small molecule. Stunner makes quantification crazy simple to free you from complicated disruption workflows, costly dyes, and wasteful standard curves.



Slam through tons of nanoparticle sizing

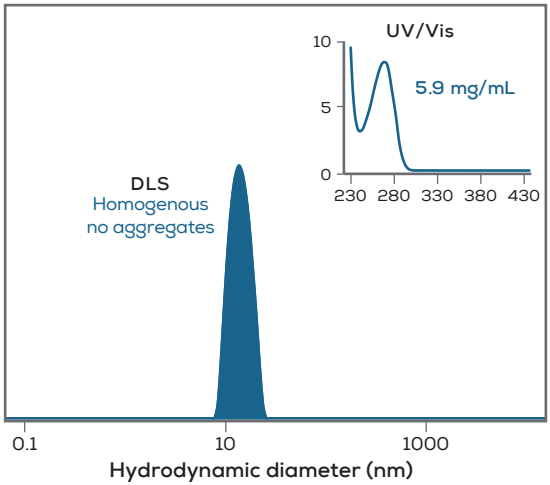
Stunner's DLS gives you the high-throughput power to round up size and size distribution data on 96 nanoparticle samples in less than 1 hour. Walk away from one-by-one DLS that requires tons of sample and hefty hands-on time. Beef up your sizing statistics with as many replicates as you want and minimize your time at the bench.

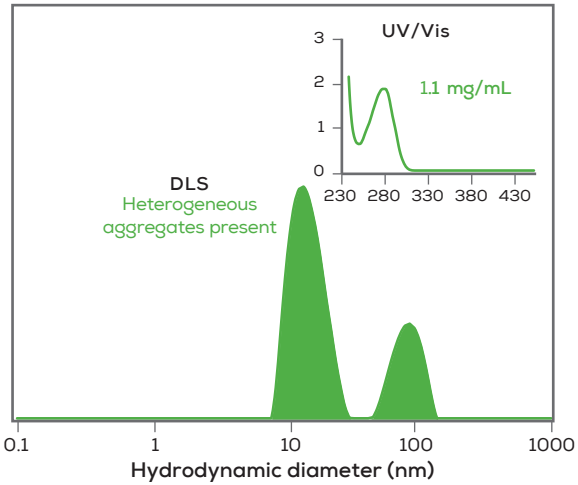




Get the skinny on proteins

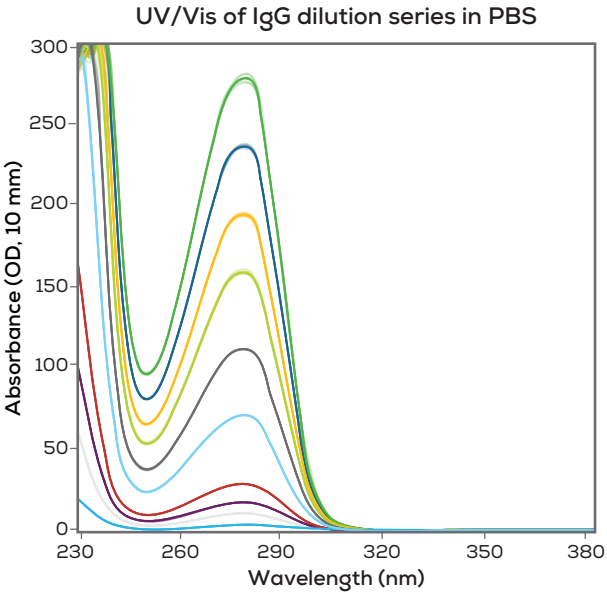
Stunner pulls rank on other systems because it's way, way more than just DLS. It lets you get a grip on what storage, agitation or a change to your process or formulation does to your protein. See if there's any aggregation, measure the hydrodynamic size, grab polydispersity when you need to check uniformity, and get the exact concentration while you're at it.

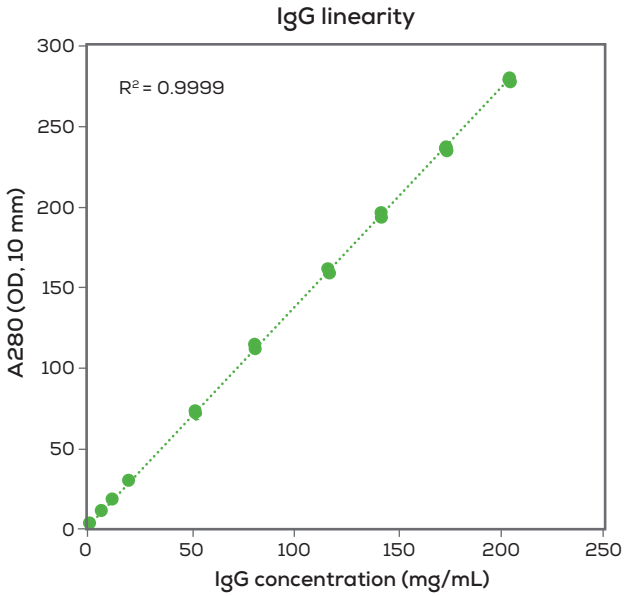




Max out your biologic

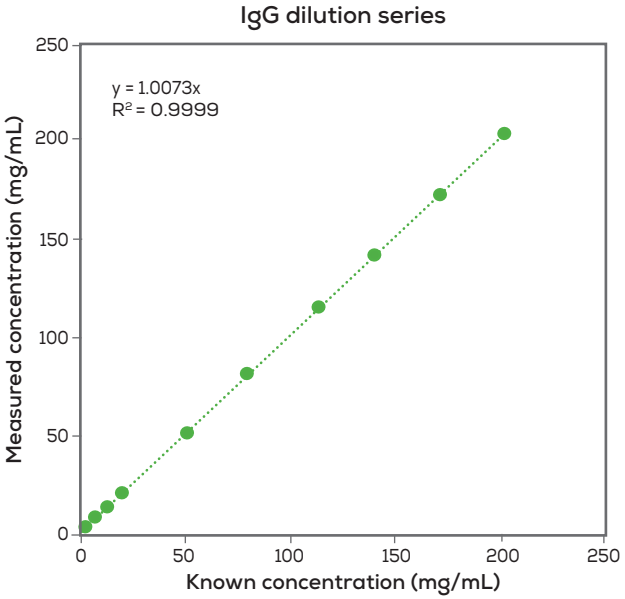
Stunner is the only system out there that can measure biologics at high-throughput and high concentration. It's got dynamic range that covers from 0.02 mg/mL to 200 mg/mL (mAb), so run any protein without ever having to dilute again. Stop the madness of running just one protein at a time – and cleaning up afterwards.





Ridiculously good data

Get spot-on precision within 1% and accuracy within 2%. Using two fixed pathlengths, Stunner gets you jaw-dropping data at both low and high protein concentrations and nails the expected concentrations every time. With the smallest sample size, the highest throughput and crazy accurate results, Stunner is hands down the best tool out there for protein quantification.

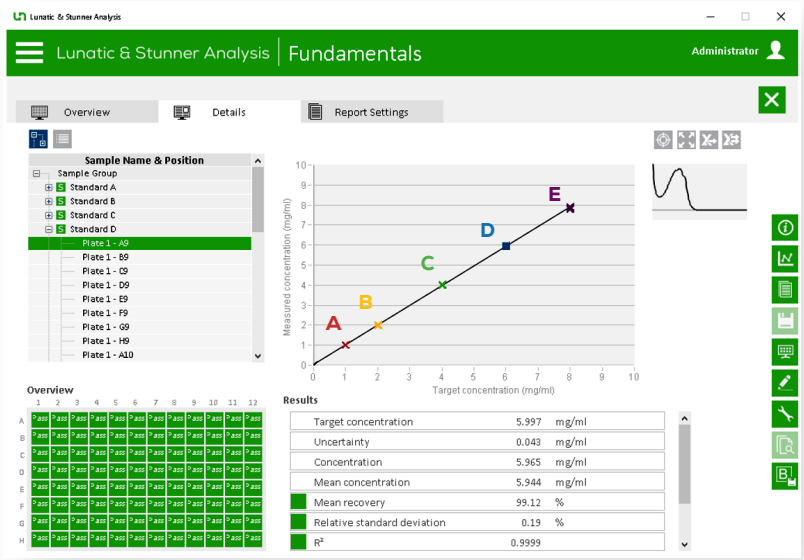


Known Conc. (mg/mL)	Average Conc. (mg/mL)	CV (%)
201.4	201.7	0.7%
169.9	171.1	0.7%
139.4	140.7	0.4%
113.1	115.0	0.6%
79.4	80.7	0.2%
50.2	51.2	0.2%
19.9	20.3	0.3%
12.1	12.2	0.2%
7.21	7.28	0.2%
2.35	2.37	0.2%

Accuracy you can show off

Stunner has shocking accuracy and wants to prove it. Using the Fundamentals tryptophan standards, the accuracy, precision and linearity of the instrument can be proven at any time – at the protein-relevant 280 nm wavelength and OD range of 20-225. Be confident about every sample with data that leaves no room for doubt.

The Fundamentals
Certified tryptophan standards
OD range 20-225

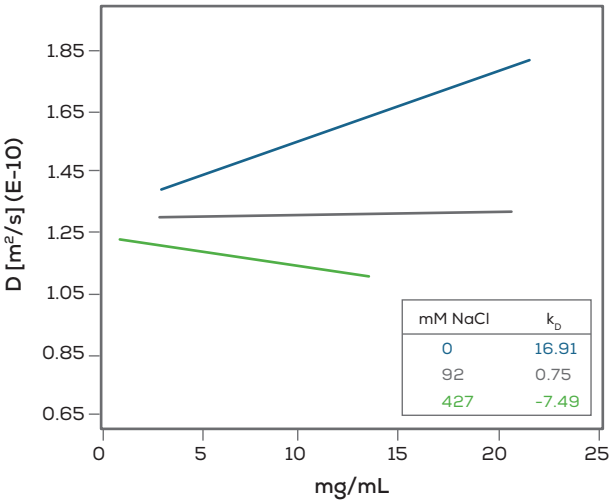


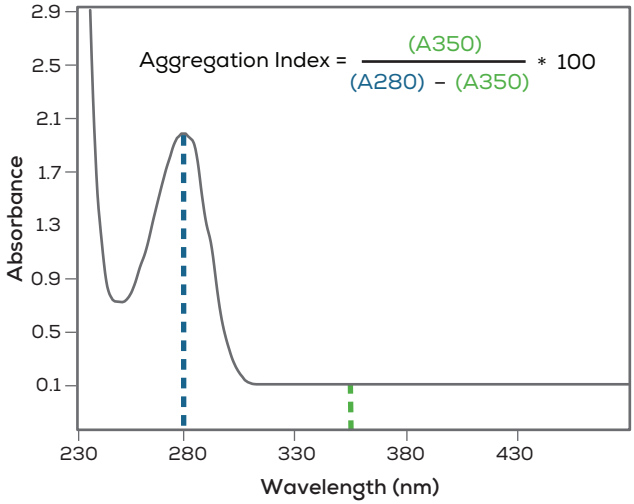
Double down with B_{22} and k_D

On the fly data tells you if your sample's in good shape, or if aggregation is in the cards. Because the concentration of each sample in the series is measured in real time with DLS, you get the most accurate values without breaking a sweat.

Brew your own

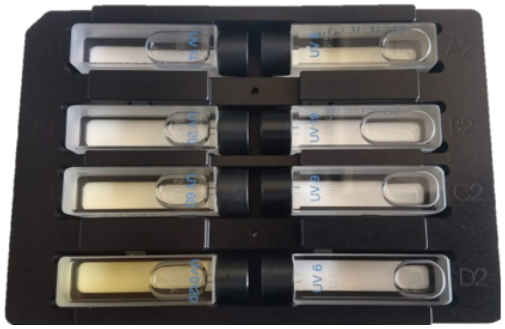
Pin down what else is going on with your sample, or just check out its other characteristics. Pick a few wavelengths, a background subtraction method, and create your favorite equation. Stunner's Homebrew tool is wide open, so you can create apps just the way you like them.



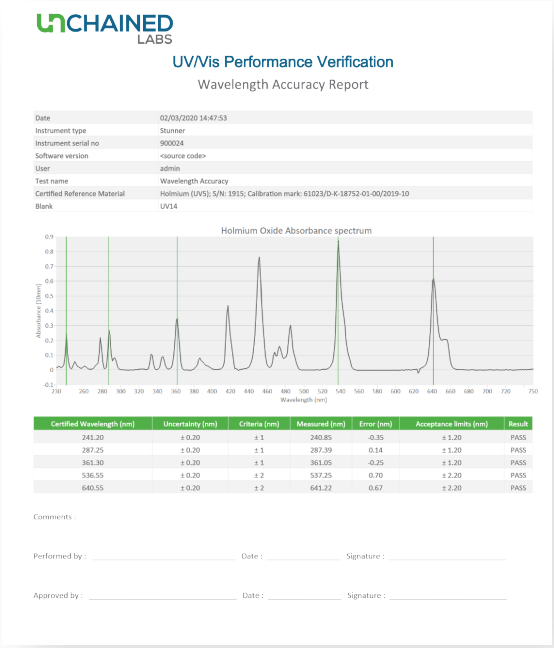


Downstream ready

Smash through the USP & Ph. Eur. UV/Vis requirements for absorbance accuracy, precision, linearity, wavelength accuracy, stray light and resolution with performance verification measurements of independently certified NIST standards. Stunner is ready when you are to get validated and make the move into QC.



Performance verification plate
Holds certified pharmacopeia standards for UV/Vis verification



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UV/Vis Performance Verification

Wavelength Accuracy Report

Date	02/03/2020 14:47:53
Instrument type	Stunner
Instrument serial no	900024
Software version	<source code>
User	admin
Test name	Wavelength Accuracy
Certified Reference Material	Holmium (UV5); S/N: 1915; Calibration mark: 61023/D-K-18752-01-00/2019-10
Blank	UV14

Holmium Oxide Absorbance spectrum

Certified Wavelength (nm)	Uncertainty (nm)	Criteria (nm)	Measured (nm)	Error (nm)	Acceptance limits (nm)	Result
241.20	± 0.20	± 1	240.85	-0.35	± 1.20	PASS
287.25	± 0.20	± 1	287.39	0.14	± 1.20	PASS
361.30	± 0.20	± 1	361.05	-0.25	± 1.20	PASS
536.55	± 0.20	± 2	537.25	0.70	± 2.20	PASS
640.55	± 0.20	± 2	641.22	0.67	± 2.20	PASS

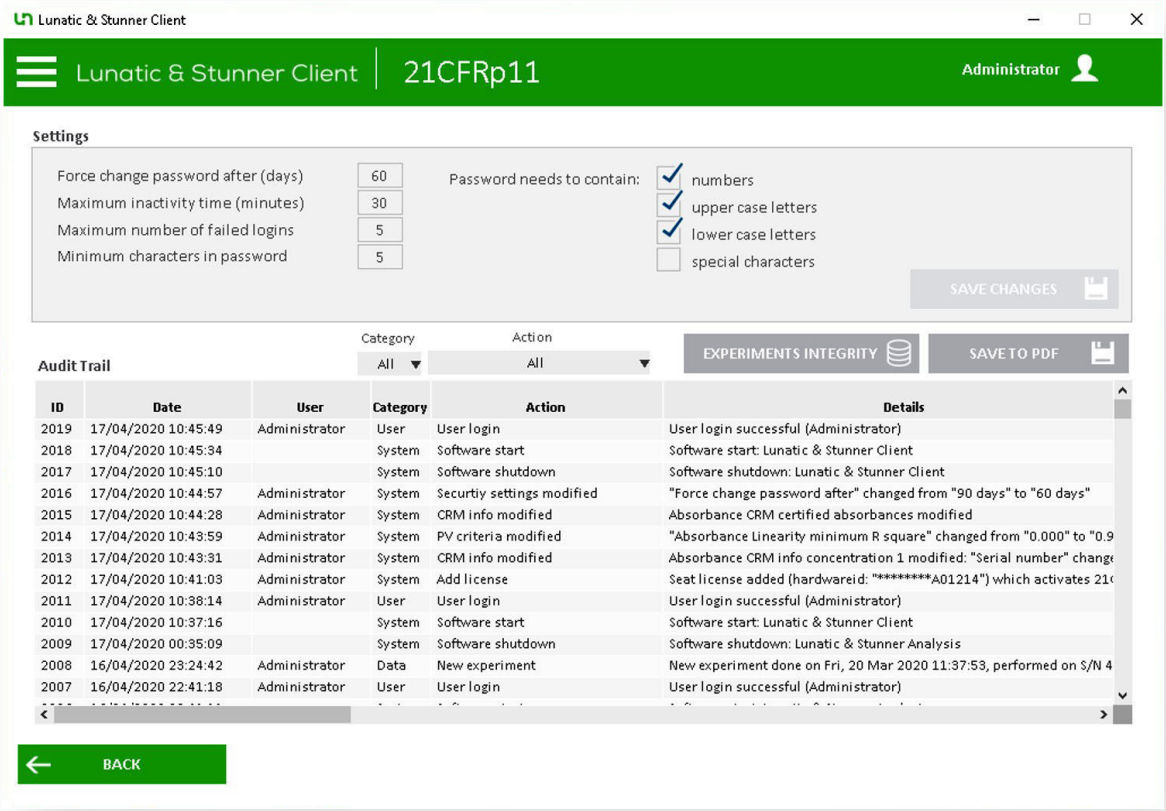
Comments :

Performed by : _____ Date : _____ Signature : _____

Approved by : _____ Date : _____ Signature : _____

Put it on lockdown

GLP labs don't sweat it. Stunner's software hooks labs up with 21 CFR Part 11 compliant features. We're talking password protection, electronic signatures, full audit trail – the whole package.



Specifications

Stunner instrument specifications		
Dimensions	37 cm W x 54 cm D x 33 cm H; 26 kg	
Electrical	Universal input voltage 100-240 V AC, 50-60 Hz	
Computer	Separate computer with Windows 10 included	
Connection	USB, TCP/IP (Service)	
Approval	CE, FCC, CSA	
Regulatory compliance	Optional 21CFRp11 software package	
UV/Vis		
Light source	Xenon flash lamp	
Detectors	UV/Vis polychromatic spectrophotometer	
Wavelength range	230-750 nm	
Wavelength accuracy	≤400nm: ±1nm; ≥400nm: ±2 nm	
Spectral resolution	Better than 2 nm (toluene in hexane)	
Absorbance precision (1 cm quartz cuvette)	<1 OD: ±0.005 OD st dev	1-2 OD: ±0.5% CV
Absorbance accuracy (1 cm quartz cuvette)	<1 OD: ±0.01 OD	1-2 OD: ±1%
DLS		
Light source	660 nm laser diode	
Detection	Avalanche photodiode module	
Size accuracy	±2%	
Minimum sample concentration	0.1 mg/mL lysozyme	
Hydrodynamic diameter range	0.3–1000nm	
Stunner plate specifications		
Samples per plate	96 (12 x 8 microplate format)	
Sample retention time	Up to 2 hours	
Recommended sample volume	2 µL	
Pathlength(s)	0.1 mm & 0.7 mm path	
Measurement time for full plate	~10 minutes for UV/Vis only; ~1 hour for UV/Vis and DLS	
Measurement range: OD 10 mm ng/µL dsDNA mg/mL ave protein mix	 0.03–275 OD 10 mm 1.5–13750 ng/µL 0.03–275 mg/mL	
Absorbance precision (10 mm pathlength)	<1 OD: ±0.01 OD st dev 1-200 OD: ±1% CV	
Absorbance accuracy (10 mm pathlength)	<1 OD: ±0.02 OD 1-200 OD: ±2%	

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Rev H