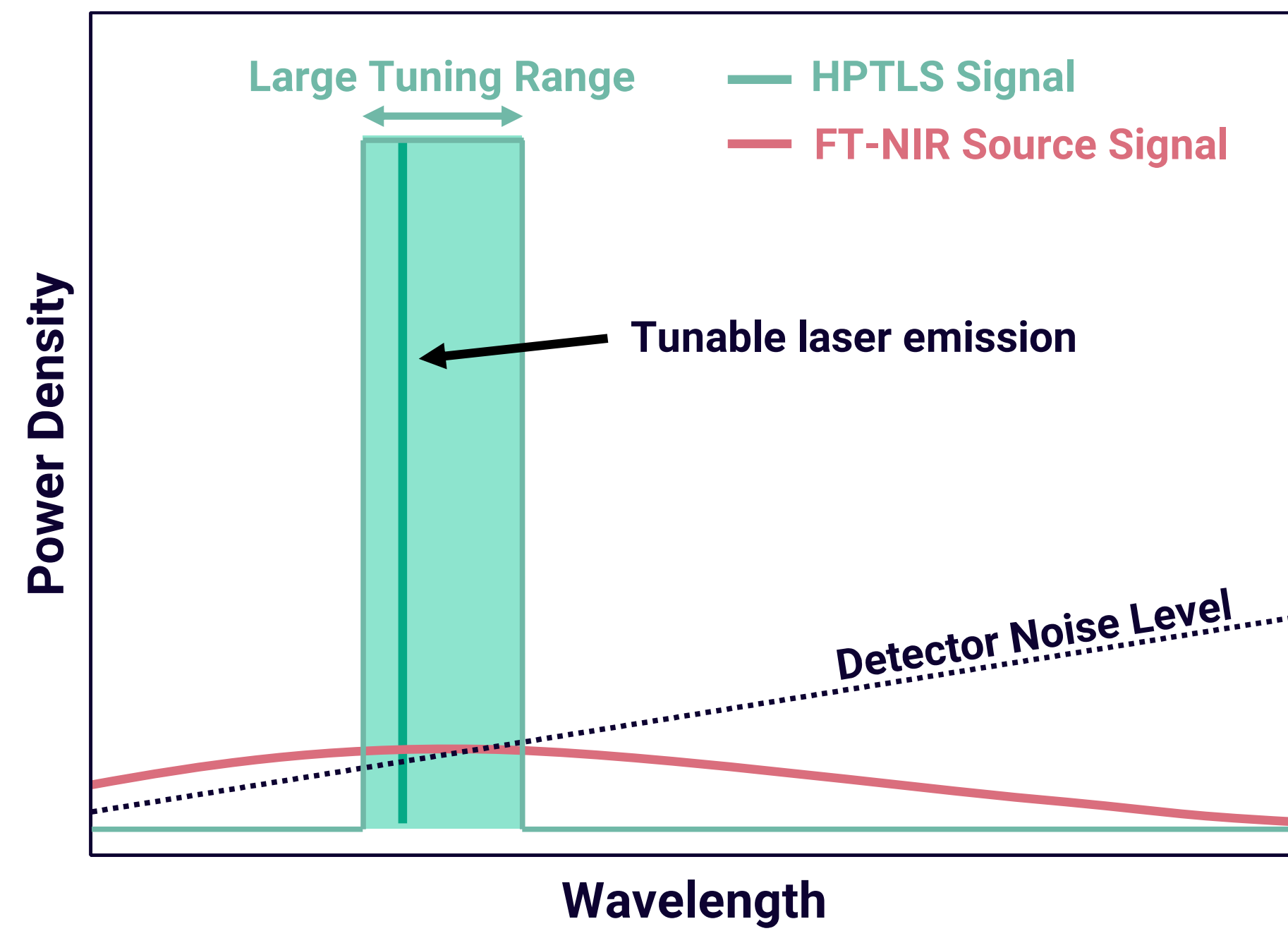


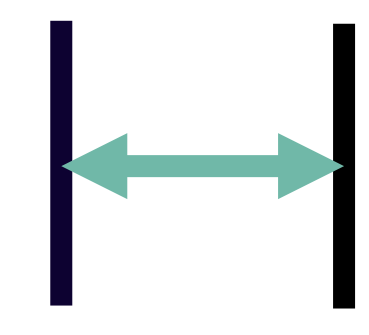
From Care to Cures: How High-Precision Tunable Laser Spectroscopy (HPTLS™) Delivers Next-Gen Accuracy and Real-Time Insights Across Complex Biologics and Personal Care Products

Erik Gustafson, Hannah Furrelle, Larissa Miropolsky, Kerin Gregory Ph.D. & Bryan Hassell, Ph.D. | www.nirrin.tech | info@nirrin.tech

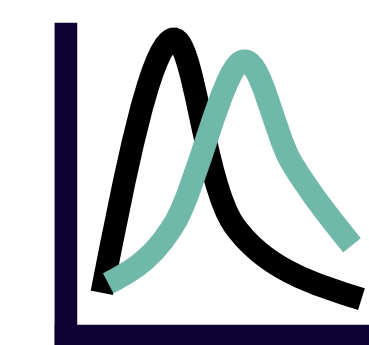
Technology: Near-Infrared (NIR) High-Precision Tunable Laser Spectroscopy (HPTLS)



Tunable lasers provide incredible repeatability in power and wavelength, vital to robust measurements



Nirrin HPTLS can tune 10-20X other tunable laser ranges (200-300nm) critical for obtaining all chemical signatures



The unique tuning range of HPTLS contains distinct spectral signatures of all bioprocess-relevant chemicals

Atlas™: three simple steps with powerful results



Patented NIR HPTLS platform brings accuracy and robustness to your process



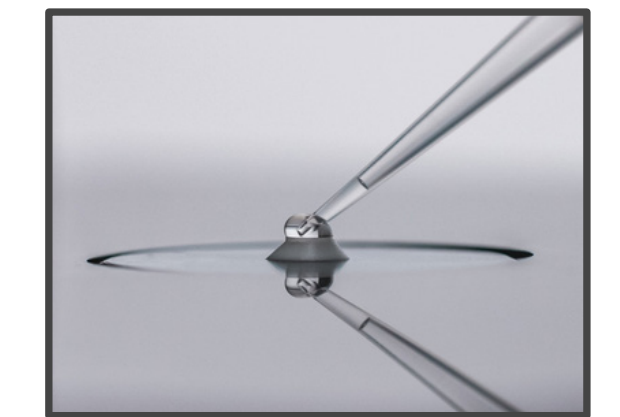
No sample prep or dilution, just 15uL and 1 min



Built-in validated spectral library components makes analysis fast and easy

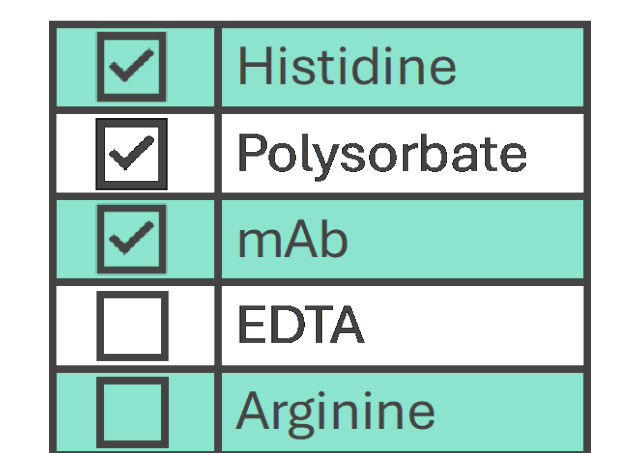


1



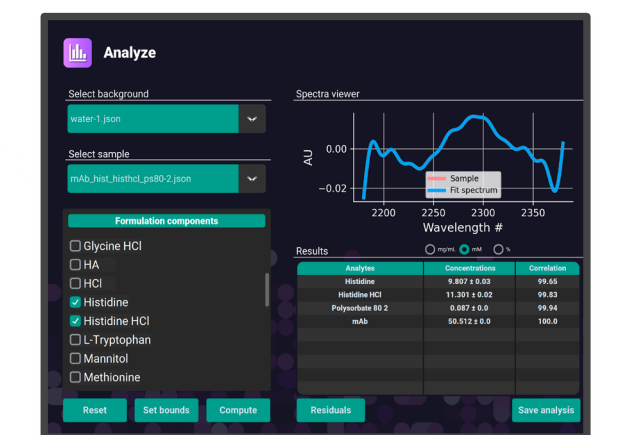
Pipette

2



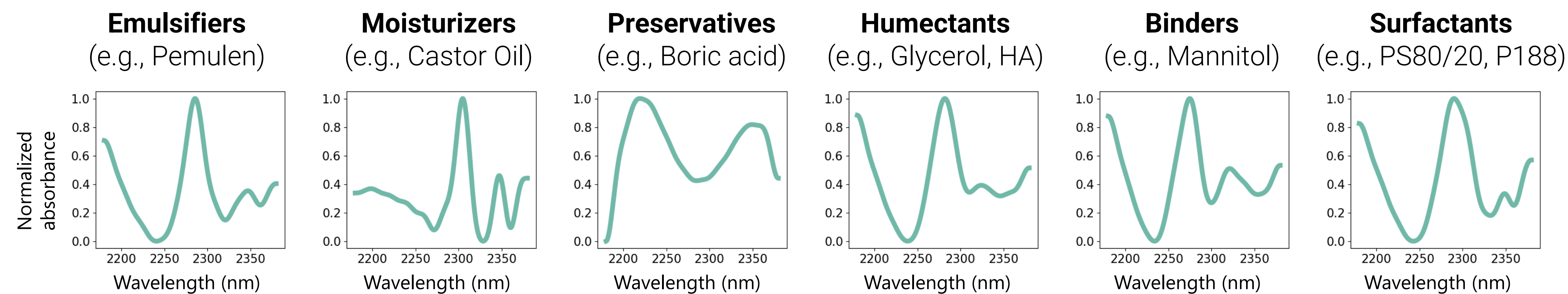
Select

3



Data

Care: Stabilizer measurements* in personal care products with no method development

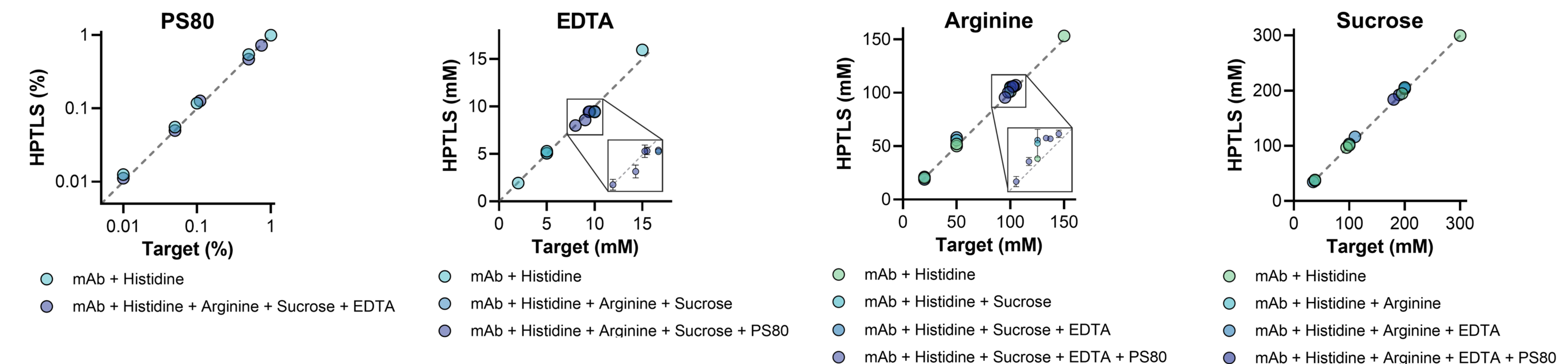


*formulation quantitative measurements not shown for confidentiality

• Unique spectral features of common personal care product constituents enables rapid quantitation with HPTLS

• Wide dynamic range of HPTLS allows for measuring all components simultaneously

Cures: Protein and excipient measurements in biologics formulations with no method development



• Samples also contained mAb ranging from 10-100mg/mL and Histidine at 20mM, all within ±5% (not shown)

• Data points represent the mean of 3 replicates
• STD of replicates less than 1% of mean