

See change®

AQS^{3®}pro MICROFLUIDIC MODULATION SPECTROSCOPY

Experience The Next Generation In Protein Characterization



Aggregation | Quantitation | Stability | Similarity | Structure

AQS³pro: The Next Generation in Protein Characterization

RedShiftBio provides next-generation infrared technology with advanced analytics to strengthen your biophysical characterization toolkit. The AOS³ pro provides critical insights into protein-based drug development through automation, improved sensitivity, and data quality.

Now with the AQS³pro, 5 measurements are provided in a single platform, providing new insights in protein structure determination, powered by Microfluidic Modulation Spectroscopy (MMS)





Aggregation



Waste/Recycle



Stability





Similarity



- IR based label-free analysis of secondary structure
- Wide sample concentration range with optimized signal to noise.
- Nearly drift-free background subtraction, even with complex formulations.
- An optimized mid-IR Quantum Cascade Laser with • greater than 100 times the sensitivity compared to FTIR

How does MMS work?

- Sample and a matching buffer stream are introduced into the transmission cell under continuous flow and then rapidly modulated (1–5 Hz) across the laser beam path.
- Measurement provides a direct assessment of background-compensated absorbance across the Amide 1 band (1700-1600cm⁻¹).
- This produces nearly drift free, background compensated, differential absorbance scans for clear Higher Order Structure (HOS) comparisons.



AQS³delta software is a powerful automated platform to easily move from raw data to results Data Flow Analysis of BSA at 1.0 mg/mL



Differential Absorbance Spectra

Continuous, rapid modulation between the sample solution and buffer reference streams produces a differential absorbance signal.



Buffer subtraction and concentration normalization enables direct protein-protein structure comparisons.





Second Derivative Spectra

Second derivative spectra accentuate the specific structural differences between protein samples

Delta of second derivative plot highlights the specific wavenumber regions where most significant differences occur in protein structure.

Strengthen Every Bioanalytical Toolkit with MMS

MMS is a novel tool that can strengthen a bioanalytical tool kit by providing critical insight through all phases of protein-based drug development. This technique enhances current workflows with the ability to monitor 5 key protein characteristics including aggregation content, concentration, structure, stability, and similarity. MMS provides the following benefits:

- A reduction in time and cost through automation
- Improvement in product quality with measurements of previously undetectable changes in protein structure.
- De-risking of downstream product failures through earlier up-stream monitoring.
- Generation of quality data for confident decisionmaking in order to accelerate development timelines.
- 96-well plate format for higher throughput with increased sample capacity. 24-Well plate format for larger volume analysis.





96- and 24-Well Plate Capacity

With options for both 24-well and 96-well plates, the AQS³pro offers true sample flexibility



Data Flow Analysis of BSA at 1.0 mg/mL, continued





Protein stability can be assessed by tracking changes in secondary structure motifs at particular wavenumbers.

(initiality)

Protein structural similarity can be compared by looking at area of overlap plot.



Higher Order Structure

Higher order structure analysis quantified the fractional content of different secondary structure motifs.



Quantitation

Protein concentration can be quantified over a linear concentration range that extends from 0.1 to >200 mg/mL.

System Specifications

System Summary

Measurement Method Measurement Type Supported Protein Measurements

Automation

Well Plate Calibration and Cleaning

Optical Source and Detector

Optical Source Spectral Range Detector Microfluidic Cell

Software

Analytics Packages Operating System File Format

Sample

Concentration Range Typical Repeatability Structure (HOS) Repeatability

Dimensions and Weights

Analyzer Unit Electronics Unit Microfluidic Modulation Spectroscopy Mid-Infrared Absorption Spectroscopy Secondary Structure, Similarity, chemical and quenched thermal stability, aggregation, quantitation

Custom 24- well and 96-well plate formats Integrated wash station, cleaning and calibration

Quantum Cascade Laser 1590 - 1710 cm⁻¹ TE cooled MCT (liquid nitrogen free) User Replacable

AQS³delta and AQS3delta - 21 CFR (optional upgrade) Windows 10 Compatible comma-separated values (.csv)

0.1 to >200 mg/mL 98% at 2 mg/mL Lysozyme in water (area of overlap) 1% at 1 mg/mL

22 H x 18.25 W x 18.5 D, 80 lbs 25 H x 10.5 W x 18 D, 40 lbs

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Class 1 Laser Device Complies with 21 CFR Chapter 1, Subchapter J, Part 1040.10

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